FINAL

Coal Combustion Waste Impoundment

Round 7 - Dam Assessment Report

Black Dog Power Station

Surface Impoundments
Northern States Power
d/b/a Xcel Energy
Burnsville, Minnesota

Prepared for:

United States Environmental Protection Agency
Office of Resource Conservation and Recovery

Prepared by:

Dewberry & Davis, LLC
Fairfax, Virginia

Under Contract Number: EP-09W001727
April 2011

FINAL

INTRODUCTION, SUMMARY CONCLUSIONS AND RECOMMENDATIONS

The release of over five million cubic yards from the Tennessee Valley Authority's Kingston, Tennessee facility in December 2008 flooded more than 300 acres of land, damaging homes and property. In response the U.S. EPA is assessing the stability and functionality of ash impoundments and other units at coal-fired power plants, and taking any needed corrective measures.

This assessment of the stability and functionality of the Black Dog Power Station Coal Combustion Waste (CCW) ponds is based on a review of available documents and on the site assessment conducted by Dewberry personnel on Thursday, September 23, 2010. We found the supporting technical documentation provided to be adequate for preparation of this report (Section 1.1.3).

In summary, the Black Dog Power Station CCW Ponds are FAIR for continued safe and reliable operation, with no recognized existing or potential management unity safety deficiencies.

PURPOSE AND SCOPE

The U.S. Environmental Protection Agency (EPA) is embarking on an initiative to investigate the potential for catastrophic failure of Coal Combustion Surface Impoundments (i.e., management unit) from occurring at electric utilities in an effort to protect lives and property from the consequences of a dam failure or the improper release of impounded slurry. The EPA initiative is intended to identify conditions that may adversely affect the structural stability and functionality of a management unit and its appurtenant structures (if present); to note the extent of deterioration (if present), status of maintenance and/or a need for immediate repair; to evaluate conformity with current design and construction standard practices; and to determine the hazard potential classification for units not currently classified by the management unit owner or by a state or federal agency. The initiative will address management units that are classified as having a Less-than-Low, Low, Significant or High Hazard Potential ranking.

In February 2009, the EPA sent its first wave of letters to coal-fired electric utilities seeking information on the safety of surface impoundments and similar facilities that receive liquid-borne material that store or dispose of CCW. This letter was issued under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e), to assist the Agency in assessing the structural stability and functionality of such management units, including which facilities should be visited to perform a safety assessment of the berms, dikes, and dams used in the construction of these impoundments.

FINAL

EPA requested that utility companies identify all management units including surface impoundments or similar diked or bermed management units or management units designated as landfills that receive liquid-borne material used for the storage or disposal of residuals or by products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals. Utility companies provided information on the size, design, age and the amount of material placed in the units. The EPA used the information received from the utilities to determine preliminarily which management units had or potentially could have High Hazard Potential ranking.

The purpose of this report is to evaluate the condition and potential of waste release from the management units. This evaluation included a site visit. Prior to conducting the site visit, a two-person team reviewed the information submitted to EPA, reviewed any relevant publicly available information from state or federal agencies regarding the unit hazard potential classification (if any) and accepted information provided via telephone communication with the management unit Operator. Also, after the field visit, additional information was received by Dewberry & Davis LLC from the operator about the Black Dog Power Station. The additional information was reviewed and also used in preparation of this report.

Factors considered in determining the hazard potential classification of the management unit(s) included the age and size of the impoundment, the quantity of coal combustion residuals or by products that were stored or disposed of in these impoundments, its past operating history, and its geographic location relative to down gradient population centers and/or sensitive environmental systems.

This report presents the opinion of the assessment team as to the potential of catastrophic failure and reports on the condition of the management unit(s).

LIMITATIONS

The assessment of dam safety reported herein is based on field observations and review of readily available information provided by the owner/operator of the subject coal combustion waste management unit(s). Qualified Dewberry engineering personnel performed the field observations and review and made the assessment in conformance with the required scope of work and in accordance with reasonable and acceptable engineering practices. No other warranty, either written or implied, is made with regard to our assessment of dam safety.

FINAL

Table of Contents

Page

FINAL

APPENDIX C

1.0 CONCLUSIONS AND RECOMMENDATIONS

1.1 CONCLUSIONS

Conclusions are based on visual observations from a one-day site visit, September 23, 2010, and review of technical documentation provided by Northern States Power, d/b/a Xcel Energy, which is provided in Appendix A.

1.1.1 Conclusions Regarding the Structural Soundness of the Management Unit(s)

As Xcel Energy acknowledged in their March 26, 2009 letter to EPA, no record of any documentation concerning the structural integrity of the ponds is available. The four Coal Combustion Waste ponds did not show any areas of significant structural concern during the one-day site visit.

1.1.2 Conclusions Regarding the Hydrologic/Hydraulic Safety of the Management Unit(s)

Hydrologic/Hydraulic calculations were not provided, so conclusion regarding hydrologic/hydraulic safety of the four ponds cannot be made at this time.

1.1.3 Conclusions Regarding the Adequacy of Supporting Technical Documentation

The supporting technical documentation provided is inadequate for preparation of this report. Data provided to Dewberry did not contain structural stability or hydrologic/hydraulic calculations. Supporting technical documentation that was reviewed is referenced in Appendix A.

1.1.4 Conclusions Regarding the Description of the Management Unit(s)

The description of the four CCW ponds provided by the operator was an accurate representation of what Dewberry observed in the field.

1.1.5 Conclusions Regarding the Field Observations

During the site visit, Dewberry was provided access to all areas in the vicinity of the four CCW ponds as well as the coal storage area, fly ash loading area, and bottom ash loading area located adjacent to the Plant. There were no visible signs of significant erosion, seepage, settlement clogged spillways or other signs of instability. During the site visit there were no indications of unsafe conditions or conditions needing immediate remedial action.

1.1.6 Conclusions Regarding the Adequacy of Maintenance and Methods of Operation

Maintenance and methods of operation appear to be adequate for all four CCW ponds.

1.1.7 Conclusions Regarding the Adequacy of the Surveillance and Monitoring Program

Surveillance and monitoring program appears to be adequate for all four CCW ponds. The ponds are not instrumented; however, based on the relatively small size of the impoundments, the history of satisfactory performance, and current methods of operation and inspection, a pond monitoring system is not needed at this time.

1.1.8 Classification Regarding Suitability for Continued Safe and Reliable Operation

The four (4) CCW ponds are classified as FAIR for continued safe and reliable operation. Acceptable performance is expected under all applicable loading conditions (static, hydrologic, seismic) in accordance with the applicable safety criteria. While structural stability documentation has not been found by the Operator, a FAIR rating is justified because of the extremely small pond sizes, the incised nature of the ponds, and the Pond 3 and Pond 4 south perimeter embankment has remained stable with no significant stability problems or failures identified by the Operator since it was constructed in the 1950's. The Fair classification given is for the original Pond 3 and 4 embankment and not for the perimeter flood control berm.

1.2 RECOMMENDATIONS

1.2.1 Recommendations Regarding the Structural Stability

Maintain frequent inspections of the Pond 3 and Pond 4 embankments along Black Dog Lake. Operator inspections should occur monthly; during and after significant rain events; and, during and after the rise and fall of flood events on Black Dog Lake. After NSP-M reviewed the draft version of this report, NSP-M proposed to add a visual structural integrity component to their existing inspection program, to be performed by an engineer, which will be implemented biannually in the Spring and Fall of each year.

1.2.2 Recommendations Regarding the Hydrologic/Hydraulic Safety

Hydrologic and Hydraulic calculations of the four ponds were not provided. It is recommended that a hydrologic and hydraulic analysis be provided or performed to evaluate the capacity of the ponds' existing spillway system and its ability to handle internal drainage flows from the

Plant site for a large localized storm event (i.e. 100-year storm). After NSP-M reviewed the draft version of this report, NSP-M proposes to perform a Hydrologic and Hydraulic analysis to demonstrate there is not an issue with the capacity of any of the existing ponds.

1.2.3 Recommendations Regarding the Maintenance and Methods of Operation

It was noted during the field assessment that there was significant vegetation and tree growth along the outside slope of the earthen embankment between Black Dog Lake and Ponds 3 and 4 that made it difficult to observe its condition. It is recommended that the outside slope of this embankment be maintained in such a way that adequate inspections of the slope can be made in the future. In response to recommendations made in the draft version of this report, NSP-M proposes to remove all understory brush (vegetation with a trunk diameter less than 2 inches) to help facilitate the inspection of the embankment. NSP-M believes that removal of trees larger than 2 inches in diameter would compromise the existing embankment and should be retained unless conditions change to the point where they pose a potential risk. This condition will be monitored by the additional biannual structural integrity inspection proposed by NSP-M under Section 1.2.1 above.

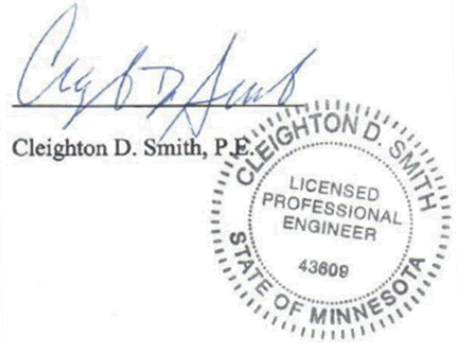
1.3 PARTICIPANTS AND ACKNOWLEDGEMENT

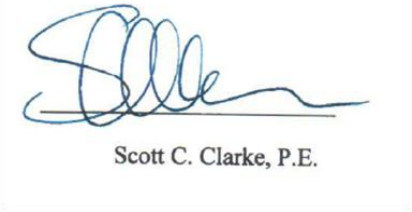
1.3.1 List of Participants during the September 23, 2010 site assessment:

Terry Coss, Xcel Energy, *Director, Environmental Materials Management*
Daniel R. Watts, Xcel Energy, *Mgr, Engineering & Technical Services*
John Chelstrom, Xcel Energy, *Sr Environmental Analyst, MPH, QEP, CHMM*
Jim Bodensteiner, Xcel Energy, *Senior Environmental Analyst/Scientist*
Thomas G Fallgren, Xcel Energy, *Plant Director*
Roger Clarke, Xcel Energy, *Manager, Waste & Remediation*
Cleighton Smith, P.E., Dewberry
Scott Clarke, P.E., Dewberry

1.3.2 Acknowledgement and Signature

We acknowledge that the four CCW ponds referenced herein were assessed on September 23, 2010.





2.0 DESCRIPTION OF THE COAL COMBUSTION WASTE MANAGEMENT UNIT(S)

2.1 LOCATION AND GENERAL DESCRIPTION

Black Dog Power Station is located in Dakota County within the northern region of Burnsville, Minnesota and is operated by Northern Stated Power d/b/a Xcel Energy. The Plant is bordered by two major bodies of waters; the Minnesota River to the north and Black Dog Lake to the south. The Plant functions as a combined coal and natural gas fired steam electric plant. The facility operates under five generator units, two of which utilize coal as the primary fuel. The coal units were built in the 1950's. See Appendix A, Document 1 and 2 for a map location of the Plant and an aerial view of the Plant looking east, respectively.

Approximately 95% of the CCW (i.e. bottom ash plus nearly 100% fly ash) produced by the coal units is transported offsite for permitted disposal. Four CCW ponds, which are connected in series, are used to manage the remaining 5% of CCW, which includes bottom ash sluice; demineralizer regenerate wastewater; boiler blowdown; yard wastewater; and, reverse osmosis reject water.

Since ground breaking of the Plant in 1949, flooding from the Minnesota River has hampered operations from time to time. Under normal conditions the river level is at approximate EL. 693 ft and CCW is managed in the ponds at an operating elevation between 697 ft and 702 ft. The highest flood crest recorded at the Plant occurred in 1965 at EL. 719.40 ft., and in 2001 a flood crest of 714.80 ft was recorded.

In 2002, the Operator constructed a flood control berm around CCW Ponds 1, 2, and 3 to keep floodwater out of the three ponds and coal storage area. The top of the flood control berm was constructed to EL. 715.00 ft, which is just above the 2001 flood crest. It is Dewberry's understanding that the flood control berm was not constructed around CCW Pond 4 due to cost and also because Pond 4 is the last settling basin in the "treatment train" of ash settling and considered to be primarily treated water before being released into Black Dog Lake.

Table 2.1 summarizes the dimension of the four CCW ponds that were assessed during the site visit.

Table 2.1: Dimensions of Incised CCW Ponds				
Dimensions [1]	**Pond 1**	**Pond 2**	**Pond 3**	**Pond 4**
Top Width (ft)	**140**	**140**	**140**	*****
Bottom Width (ft)	**100**	**100**	**100**	*****
Top Length (ft)	**700**	**700**	**700**	*****
Bottom Length (ft)	**660**	**660**	**660**	*****
Depth (ft)	**10**	**10**	**10**	**10**
Side Slopes	**2:1**	**2:1**	**2:1**	**2:1**
*** - Information not available but the approximate surface area is 9.3 acres as determined by the Operator** **[1] - Appendix A, Documents 4 thru 6**				

2.2 SIZE AND HAZARD CLASSIFICATION

CCW Ponds 1, 2, and 3 each have a design storage capacity of 13 acre-feet with a maximum design height for storage of 10 feet. CCW Pond 4 has a design storage capacity of approximately 93 acre-feet with a maximum design height of 10 feet. Based on Table 2.2a, all four ponds are classified as small size impoundments.

Table 2.2a: USACE ER 1110-2-106 Size Classification		
	Impoundment	
Category	**Storage (Ac-ft)**	**Height (ft)**
Small	**50 and < 1,000**	**25 and < 40**
Intermediate	1,000 and < 50,000	40 and < 100
Large	> 50,000	> 100

The four CCW ponds have a Low Hazard Classification based on Table 2.2b. Loss of life would not be expected if a failure were to occur and given the small size of the impoundments, economic, environmental and lifeline losses would be low and generally limited to the Operator's property.

Table 2.2b: FEMA Federal Guidelines for Dam Safety Hazard Classification		
	Loss of Human Life	**Economic, Environmental, Lifeline Losses**
Low	**None Expected**	**Low and generally limited to owner property**
Significant	None Expected	Yes
High	Probable. One or more expected	Yes (but not necessary for classification)

2.3 AMOUNT AND TYPE OF RESIDUALS CURRENTLY CONTAINED IN THE UNIT(S) AND MAXIMUM CAPACITY

The data reviewed by Dewberry did not include the volume of residuals stored in the four CCW ponds at the time of inspection. Table 2.1 summarizes the storage capacity of the four CCW ponds.

Table 2.1: Storage Capacity of CCW Ponds				
Item [1]	**Pond 1**	**Pond 2**	**Pond 3**	**Pond 4**
Surface Area (ac)	**2.2**	**2.2**	**2.2**	**9.3**
M.D.S.C. (cy)	**20,975**	**20,975**	**20,975**	**104,870**
M.D.S.C. (ac-ft)	**13**	**13**	**13**	**65**
M.D.S.E.(ft)	**702**	**702**	**702**	**702**
T.S.C.T.O.B (cy)	**30,655**	**30,655**	**30,655**	**150,040**
T.S.C.T.O.B (ac-ft)	**19**	**19**	**19**	**93**
T.O.B. (ft)	**705**	**705**	**705**	**705**
N.P. (varies) (ft)	**697-702**	**697-702**	**697-702**	**697-702**
Pond Invert (ft)	**695**	**695**	**695**	**695**

1 - Calculated from Appendix A, Documents 4 thru 6; Pond 4 surface area estimated by Operator
M.D.S.C. = Max. Design Storage Capacity
M.D.S.E = Max. Design Storage Elevation
T.S.C.T.O.B = Total Storage Capacity to Top of Bank
T.O.B. = Top of Bank Elevation
N.P. = Normal Pool Operation Range

2.4 PRINCIPAL PROJECT STRUCTURES

2.4.1 Earth Embankment

When the Plant was put into service in the mid 1950's, there was a single pond that collected CCW. The eastern, western, and northern perimeters of the single pond were incised and the southern perimeter consisted of an earthen embankment between the single pond and Black Dog Lake. The assumed design top elevation of the earthen embankment when it was constructed was 705 ft based on information provided to Dewberry. The single pond was divided into four smaller ponds in 1975, whereby three interior dikes were constructed to a top design elevation of 705 ft.

Design drawings provided in Appendix A together with information provided by Xcel Energy to EPA in their March 26, 2009 letter indicate that the footprint of the four ponds is incised on the eastern, western and northern perimeters. Along these perimeters the maximum operating range of the CCW (EL. 702 ft) does not appear to be in contact with any manmade fill. Along the southern perimeter of Ponds 3 and 4, manmade embankment material was placed adjacent to Black Dog Lake in the mid 1950's. The design top elevation of the embankment when it was first constructed is estimated to be 705 ft. In the mid 1970's to mid 1980's, three dikes were constructed that formed the four ponds known today.

In 2002, the Operator constructed a flood berm around Ponds 1, 2, 3 and the plant's coal storage area located to the immediate west of the ponds. The flood control berm raised the grades around Pond 1, 2 and 3 from 705 ft to a 715 ft. The flood control berm was designed to keep floodwaters from the Minnesota River and Black Dog Lake out of the three ponds and coal storage area. The flood berm was not built with the intent of providing additional storage capacity for CCW. The Operator noted during the site visit that Minnesota DNR does not consider the embankment of the four ponds to be dams that are subject to their review.
Outlet Structures

The primary outlet structure is located in the south-east corner of pond 4 (Appendix A, Document 3; and Figure 5.3-1). The outlet structure consists of a concrete drop inlet spillway with a 42-inch CMP. The spillway also contains a 12-inch sluice gate which serves as a low level drain for dewatering the ponds when required.

2.5 CRITICAL INFRASTRUCTURE WITHIN FIVE MILES DOWN GRADIENT

There is no critical infrastructure immediately downstream of the four CCW ponds; however, the following infrastructure does exist.

- Cedar Ave. MN – 77 Bridge over Minnesota River located approximately 0.8 miles NE.
- I-494 Bridge over Minnesota River located approximately 3.7 miles NE.
- Minnesota St. Paul's International Airport (MSP) and Fort Snelling State Park are both located approximately 4.5 miles NE.

3.0 SUMMARY OF RELEVANT REPORTS, PERMITS, AND INCIDENTS

3.1 SUMMARY OF LOCAL, STATE, AND FEDERAL ENVIRONMENTAL PERMITS.

Minnesota DNR does have a dam safety program; however, according to the Operator, Minnesota DNR has provided verbal confirmation to the Operator that the embankment and internal dikes of the four ponds are not subject to their review.

The impoundment has been issued a National Pollutant Discharge Elimination System Permit; Permit No. MN0000876 was issued March 24, 2008, and expires February 28, 2013 (Appendix A, Document 8).

3.2 SUMMARY OF SPILL/RELEASE INCIDENTS

Data reviewed by Dewberry did not indicate any spills, unpermitted release, or other performance related problems associated with the four CCW ponds.

4.0 SUMMARY OF HISTORY OF CONSTRUCTION AND OPERATION

4.1 SUMMARY OF CONSTRUCTION HISTORY

4.1.1 Original Construction

The Black Dog Power Station broke ground in 1949. A single pond located in the approximate footprint of today's four CCW ponds was constructed in the mid 1950's to manage CCW.

4.1.2 Significant Changes/Modifications in Design since Original Construction

In 1975 thru the early to mid 1980's the single CCW pond was divided into four smaller CCW ponds. In addition, the outlet structure spillway in Pond 4 was designed and constructed. In 2002, a flood control berm was constructed around CCW ponds 1, 2, and 3.

4.1.3 Significant Repairs/Rehabilitation since Original Construction

Other than those described under Section 4.1.2, data reviewed by Dewberry did not indicate any significant repairs/rehabilitation to the four ponds since original construction.

4.2 SUMMARY OF OPERATIONAL PROCEDURES

4.2.1 Original Operational Procedures

Data reviewed by Dewberry did not contain the original operational procedures for the single CCW pond constructed in the mid 1950's.

4.2.2 Significant Changes in Operational Procedures and Original Startup

Significant changes in operation procedures and original startup cannot be confirmed based on the data reviewed by Dewberry.

4.2.3 Current Operational Procedures

Storm water runoff and approximately 5% of the total CCW is sluiced into settling Pond 3, which flows into settling Pond 2, which flows into settling Pond 1, which flows into settling Pond 4, and finally discharges through the Pond 4 spillway into Black Dog Lake. The effluent leaving Pond 4 is equivalent to approximately 5 MGD for 2 days every 1-2 months. The remaining 95% of CCW is hauled offsite for permitted disposal. The 95% also includes nearly 100% of the processed fly ash. CCW includes a combination of bottom ash sluice, boiler blow down, yard wastewater and reverse osmosis reject water.

4.2.4 Other Notable Events since Original Startup

No additional information was provided to Dewberry concerning notable events impacting the operation of the ponds; however, the following is a list of the recorded flood crests that likely hampered operations after the Plant was constructed in the mid 1950's.

- 719.40 ft on 04/15/1965
- 716.90 ft on 04/15/1969
- 715.20 ft on 04/13/1997
- 714.80 ft on 04/19/2001
- 714.50 ft on 04/29/2001
- 714.20 ft on 04/16/1952
- 713.70 ft on 06/26/1993
- 711.70 ft on 04/15/1951
- 710.92 ft on 03/24/2010 (ponds 1, 2, 3 protected by flood berm)
- 708.40 ft on 06/29/1957
- 708.10 ft on 05/06/1986

5.0 FIELD OBSERVATIONS

5.1 PROJECT OVERVIEW AND SIGNIFICANT FINDINGS

Dewberry personnel, Cleighton D. Smith, P.E. and Scott C. Clarke, P.E., performed a site visit on September 23, 2010 in company with the participants listed in Section 1.3.1.

The site visit began at 7:30 AM. The weather was cold and rainy. Photographs were taken of conditions observed. All pictures were taken by Dewberry personnel during the site visit. Representative photographs are provided in this Section. The Dam Inspection Checklist is in Appendix B.

As discussed under Section 2.4.1, there is one earthen embankment located between Black Dog Lake and the southern perimeter of Ponds 3 and 4. The footprint of the four ponds is incised on the eastern, western and northern perimeters. This report focuses on the earthen embankment and outlet structure between Black Dog Lake and Ponds 3 and 4, which is considered the "critical" embankment if it were to fail. The three interior dikes that create the four ponds are not considered "critical" structures; however, all four ponds and dikes were documented with photographs.

In general, the overall assessment of the four ponds was that they were in FAIR condition and no significant findings were noted.

5.2 EARTHEN EMBANKMENT 1 OF 1

5.2.1 Crest

The crest of the embankment had no signs of significant depressions, tension cracks or other indications of settlement or shear failure. Figure 5.2.1-1 and Figure 5.2.1-2 show the typical crest condition of the embankment along Pond 3 and Pond 4, respectively.

Figure 5.2.1-1: Crest of embankment looking east; Pond 3 is to the left and Black Dog Lake is to the right; Crest also serves as the flood control berm; Note flood control berm wrapping to the left in the distance around Ponds 3, 2, and 1

Figure 5.2.1-2: Crest of embankment looking west; Pond 4 is to the right and Black Dog Lake is to the left; Crest does not serve as the flood control berm; Note the flood control berm wrapping to the right in the distance around Ponds 3, 2, and 1, which are not shown in the photo

5.2.2 Upstream/Inside Slope

The inside slope of the embankment, including all groins, had a coverage of mixed grasses/weeds and gravel adjacent to Pond 3, and mixed grasses/weeds adjacent to Pond 4. There were no observed scarps, sloughs, bulging, cracks, depressions or other indications of slope instability. Figures 5.2.2-1 and 5.2.2-2 show a representative section of the embankment looking east and west from Pond 3 and Pond 4, respectively.

Figure 5.2.2-1: Inside slope of embankment looking east; Pond 3 is located to the immediate left

Figure 5.2.2-2: Inside slope of embankment looking west; Pond 4 is located to the immediate right

5.2.3 Downstream/Outside Slope and Toe

The outside slope of the embankment is vegetated with various species of tall grasses and weeds. The toe of the embankment follows the shoreline of Black Dog Lake where there are trees also growing. Heavy overgrowth along the outside slope of the embankment and toe made close observation of the embankment difficult. Based on what could be observed there were no scarps, sloughs, bulging, cracks, depressions or other indications of slope instability. Figures 5.2.3-1 and 5.2.3-2 show a representative section of the embankment looking west from Pond 3 and Pond 4.

Figure 5.2.3-1: Outside slope of embankment to the left looking west; Pond 3 is located to the immediate right

Figure 5.2.3-2: Outside slope of embankment to the left looking west; Pond 4 is located to the immediate right

5.2.4 Abutments and Groin Areas

The eastern embankment abutment was heavily vegetated with no visible signs of erosion or stress. The western embankment abutment could not be assessed due to the presence of heavy vegetation and the existing flood control berm that was constructed along the top of the original embankment. A description of the groin areas is provided in Section 5.2.2.

5.3 OUTLET STRUCTURES

5.3.1 Overflow Structure

The system of four CCW ponds discharges into Black Dog Lake through a spillway structure located in the south-east corner of Pond 4. The spillway was observed to be working properly, discharging flow from the pond, and visually appeared to be in satisfactory condition. There were no signs of clogging of the spillway and the water exiting the structure was flowing clear. Figure 5.3.1- 1 shows the spillway overflow structure.

Figure 5.3.1-1: Overflow spillway structure looking north across Pond 4 from top of embankment

5.3.2 Outlet Conduit

The outlet conduit consists of a 42-inch pipe with a trash rack on its downstream outfall at Black Dog Lake. The conduit appeared to be in good shape with no visible signs of clogging and the water exiting the outlet was flowing clear. Figure 5.3.2-1 shows the outfall of the outlet conduit.

Figure 5.3.2-1: Outfall of outlet conduit in operation

5.3.3 Emergency Spillway

A separate emergency spillway was not observed. It is unclear, based on the documentation provided, if the overflow spillway also serves as the emergency spillway for the impoundment (i.e. a combined drop-inlet principle/emergency spillway). After NSP-M reviewed the draft version of this report, NSP-M confirmed that the only outlet from pond 4 is the outfall shown in Figure 5.3.2-1.

5.3.4 Low Level Outlet

The overflow spillway structure contains a 12-inch sluice gate that can be manually operated to serve as a low level outlet/drain when dewatering of the impoundment is required (Appendix A, Document 3).

6.0 HYDROLOGIC/HYDRAULIC SAFETY

6.1 SUPPORTING TECHNICAL DOCUMENTATION

6.1.1 Flood of Record

The Minnesota River flood of record at the Plant is 719.40 ft, which crested on 04/15/1965. No information was provided for a localized flood elevation of record inside of the four ponds.

6.1.2 Inflow Design Flood

Data reviewed by Dewberry did not contain Inflow Design Flood information.

6.1.3 Spillway Rating

Data reviewed by Dewberry did not contain Spillway Rating information.

6.1.4 Downstream Flood Analysis

Data reviewed by Dewberry did not contain a downstream flood analysis; however, the FEMA Flood Insurance Rate Map for Burnsville, Minnesota reflects a Base Flood Elevation (100-year water-surface elevation) of 716 ft on the Minnesota River at the Plant location.

6.2 ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

Data reviewed by Dewberry did not contain the necessary documentation to make a proper determination on adequacy of hydrologic and hydraulic safety factors that were or were not considered in the design of the four CCW ponds.

6.3 ASSESSMENT OF HYDROLOGIC/HYDRAULIC SAFETY

Hydrologic/Hydraulic calculations were not provided.

7.0 STRUCTURAL STABILITY

7.1 SUPPORTING TECHNICAL DOCUMENTATION

7.1.1 Stability Analyses and Load Cases Analyzed

As Xcel Energy acknowledged in their March 26, 2009 letter to EPA, no record of any documentation concerning the structural integrity of the ponds is available. Dewberry did not receive technical documentation regarding the structural stability of the four impoundments.

7.2 ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

Data reviewed by Dewberry did not contain the necessary documentation to make a proper determination on structural stability factors that were or were not considered in the design of the four CCW ponds.

7.3 ASSESSMENT OF STRUCTURAL STABILITY

Though structural stability technical documentation could not be provided, overall, the structural stability of the southern earthen embankment between CCW ponds 3 and 4 and Black Dog Lake appears to be fair based on the following facts:

- No observed or documented obvious signs of erosion damage, cracks, sloughs or release of materials;
- Outlet works are clear and appear to be in good working condition;
- The embankment has been in-place since the mid 1950's with no evidence of documented failures;
- The Plant has an adequate inspection program though their Plant Management Directive, Storm Water Pollution Prevention Plan, which requires inspections of the pond facilities; and,
- Since 1950 at least eleven major floods have inundated the embankment, which resulted in no documented failures of the embankment.
- The four ponds are extremely small. Three of the four ponds are about 2 acres in size. Pond 4 is less than 10 acres.

8.0 ADEQUACY OF MAINTENANCE AND METHODS OF OPERATION

8.1 OPERATING PROCEDURES

Approximately 5% of the total CCW is sluiced into settling Pond 3, which flows into settling Pond 2, which flows into settling Pond 1, which flows into settling Pond 4 before being discharged from Pond 4 into Black Dog Lake. The effluent leaving Pond 4 is equivalent to approximately 5 MGD for 2 days every 1-2 months.

As a note, according to the Xcel Energy Upper Midwest Resource Plan (2011-2025) that was filed by the Operator with the Minnesota Public Utilities Commission, the two remaining coal burning units (Black Dog 3 and 4) will likely be retired in 2013.

8.2 MAINTENANCE OF THE DAM AND PROJECT FACILITIES

The Plant has adopted a Storm Water Pollution Prevention Plan as a Plant Management Directive, which requires site inspections every two months during non-frozen conditions including the four CCW ponds. One of the inspections is performed while storm water is discharging. Inspections are performed to determine the maintenance requirements for the ponds and other structural and non-structural onsite storm water management practices. The Operator also noted that the protective flood control berm is inspected monthly by Plant staff.

8.3 ASSESSMENT OF MAINTENANCE AND METHODS OF OPERATIONS

8.3.1 Adequacy of Operating Procedures

Based on documentation provided by the Operator; discussions with the Operator; and, the one-day field inspection performed by Dewberry, it appears that operating procedures that include the four CCW ponds are adequate.

8.3.2 Adequacy of Maintenance

Based on visual observations and the maintenance procedures in place per the Plant's Storm Water Pollution Prevention Plan, the four CCW ponds, in general, appear to be adequately maintained. However, further consideration to maintaining vegetation and tree growth along the outside slope of the embankment between Black Dog Lake and Ponds 3 and 4 needs to be addressed so that full inspections of the embankment slope can occur in the future.

9.0 ADEQUACY OF SURVEILLANCE AND MONITORING PROGRAM

9.1 SURVEILLANCE PROCEDURES

The plant has adopted a Storm Water Pollution Prevention Plan for surveillance of the ponds as described above in Section 8.2.

9.2 INSTRUMENTATION MONITORING

The Black Dog Power Station CCW ponds do not have an instrumentation monitoring system.

9.3 ASSESSMENT OF SURVEILLANCE AND MONITORING PROGRAM

9.3.1 Adequacy of Inspection Program

Based on the data reviewed by Dewberry, including observations during the site visit, the inspection program appears to be adequate.

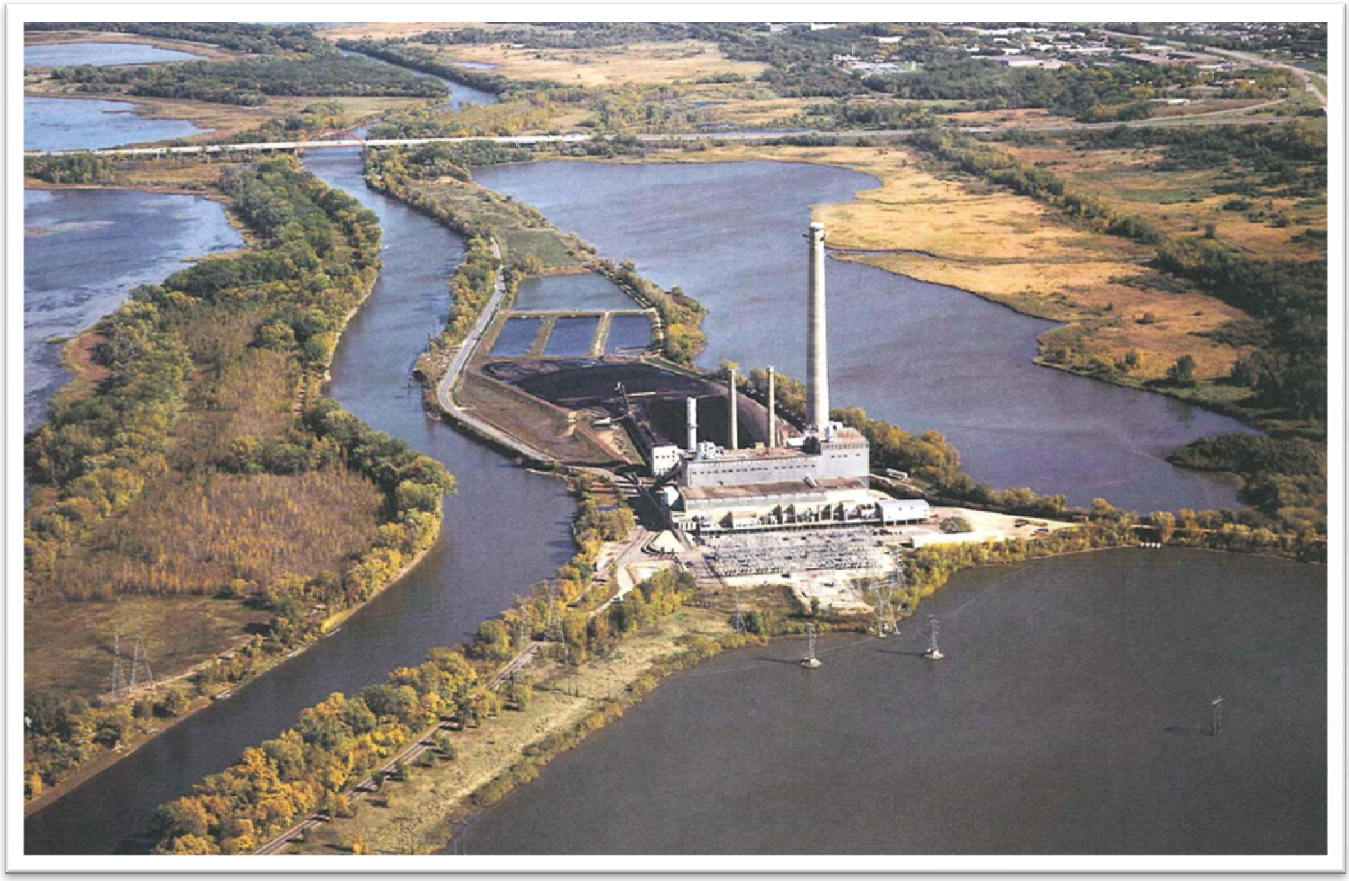
9.3.2 Adequacy of Instrumentation Monitoring Program

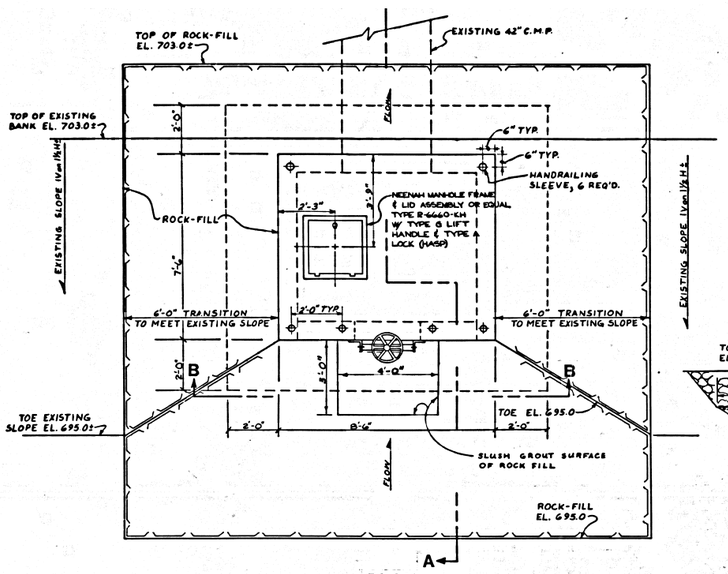
No instrumentation is present at the four CCW ponds

APPENDIX A
Documents

Document 1: Site Map

Document 2: Aerial Photograph

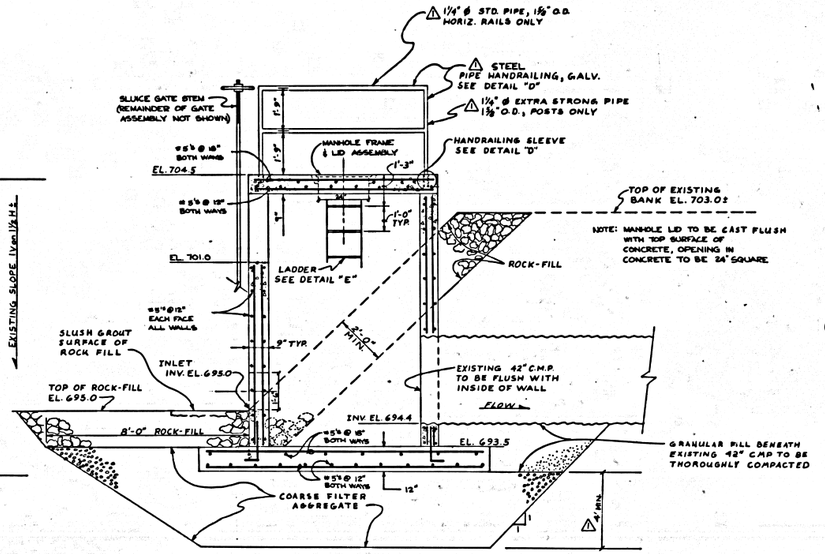




PLAN

OUTLET STRUCTURE-POND#4

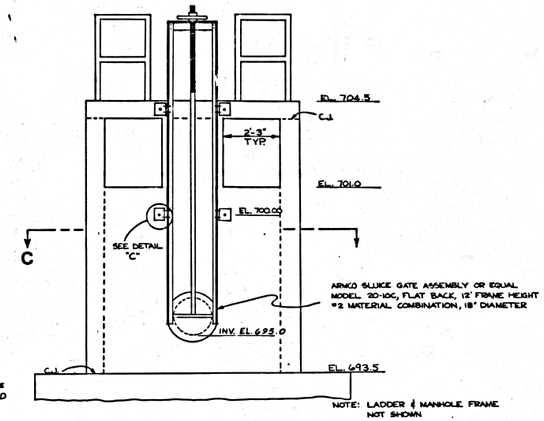
SCALE 1/2"=1'-0"



SECTION A-A

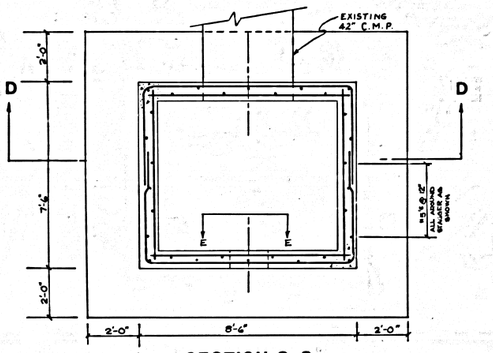
SCALE 1/2"=1'-0"

⚠ NOTE:
UPON EXCAVATION OF EXISTING 42" C.M.P. A CONCRETE HEADWALL STRUCTURE WAS ENCOUNTERED. THIS REQ'D. THAT THE NEW OUTLET STRUCTURE BE MOVED 3' POHOWARD. A 3' LONG EXTENTION PIECE OF 42" ø C.M.P. AND A COLLAR WERE REQ'D FOR THIS CHANGE. THE EXISTING HEADWALL STRUCTURE WAS LEFT IN PLACE.



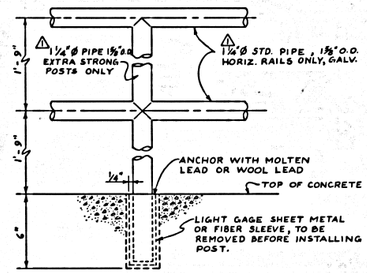
SECTION B-B

SCALE 1/2"=1'-0"



SECTION C-C

SCALE 1/2" = 1'-0"

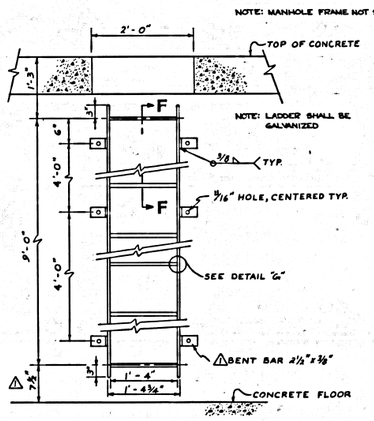


TYPICAL HANDRAILING DETAIL "D"

SCALE 3" = 1'-0"

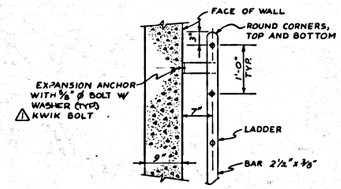
(HANDRAILING AND POST ANCHORAGE IN CONCRETE)

NOTE: MANHOLE FRAME NOT SHOWN



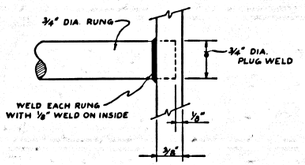
LADDER DETAIL "E"

SCALE 1"=1'-0"



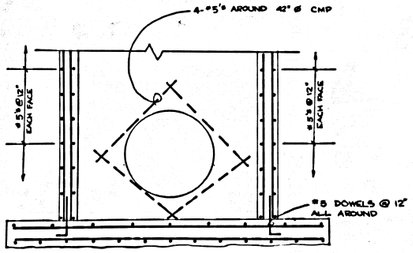
SECTION F-F

SCALE 1"=1'-0"



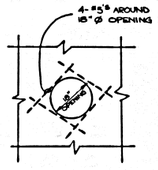
DETAIL "G"

SCALE- FULE SIZE



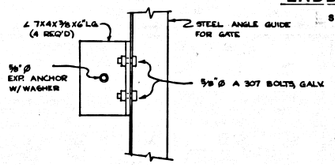
SECTION D-D

SCALE 1/2"=1'-0"



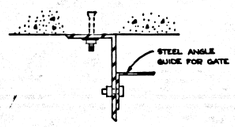
SECTION E-E

SCALE 1/2"=1'-0"



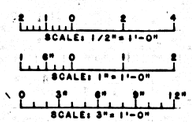
DETAIL C

SCALE 3"=1'-0"



PLAN

SCALE 3"=1'-0"



NOTES:

1. SLUICE GATE SHALL BE ATTACHED AS PER MANUFACTURER'S RECOMMENDATIONS.
2. ALL STEEL TO BE A36 EXCEPT AS NOTED.
3. GALVANIZING SHALL BE AS PER ASTM A123-78.
4. TOP SLAB MAY BE PRECAST AND PLACED UPON A MORTAR BEDDING.
5. EXPANSION ANCHORS SHALL MEET FEDERAL SPEC. FF-S-325 GROUP II TYPE 4 CLASS 1, GROUP III TYPE 1 OR GROUP VIII TYPE 1, ANCHORS SHALL BE GALVANIZED.
6. EXISTING TIMBER OUTLET STRUCTURE TO BE REMOVED.

REFERENCES:

1. GENERAL CONCRETE NOTES. . . . . SHEET 7
2. LOCATION . . . . . SHEET 1

REFERENCES:

NF-91918	PLAN
NF-91919	PLAN & PROFILE
NF-91920	TYPICAL SECTIONS
NF-91921	MANHOLES
NF-91922	SLUICE GATE BOX DETAILS
NF-91923	BOILER ROOM DETAILS AT NEW PUMPS
NF-91924	INLET STRUCTURE- POND #2

⚠ ADDED AS BUILT DATA

⚠ AS BUILT

I CERTIFY THAT THIS DRAWING WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Glen S. Bengtson

GLEN S. BENGTSON REG. NO. 13974

DATE 6/5/80

indeco

REVISIONS

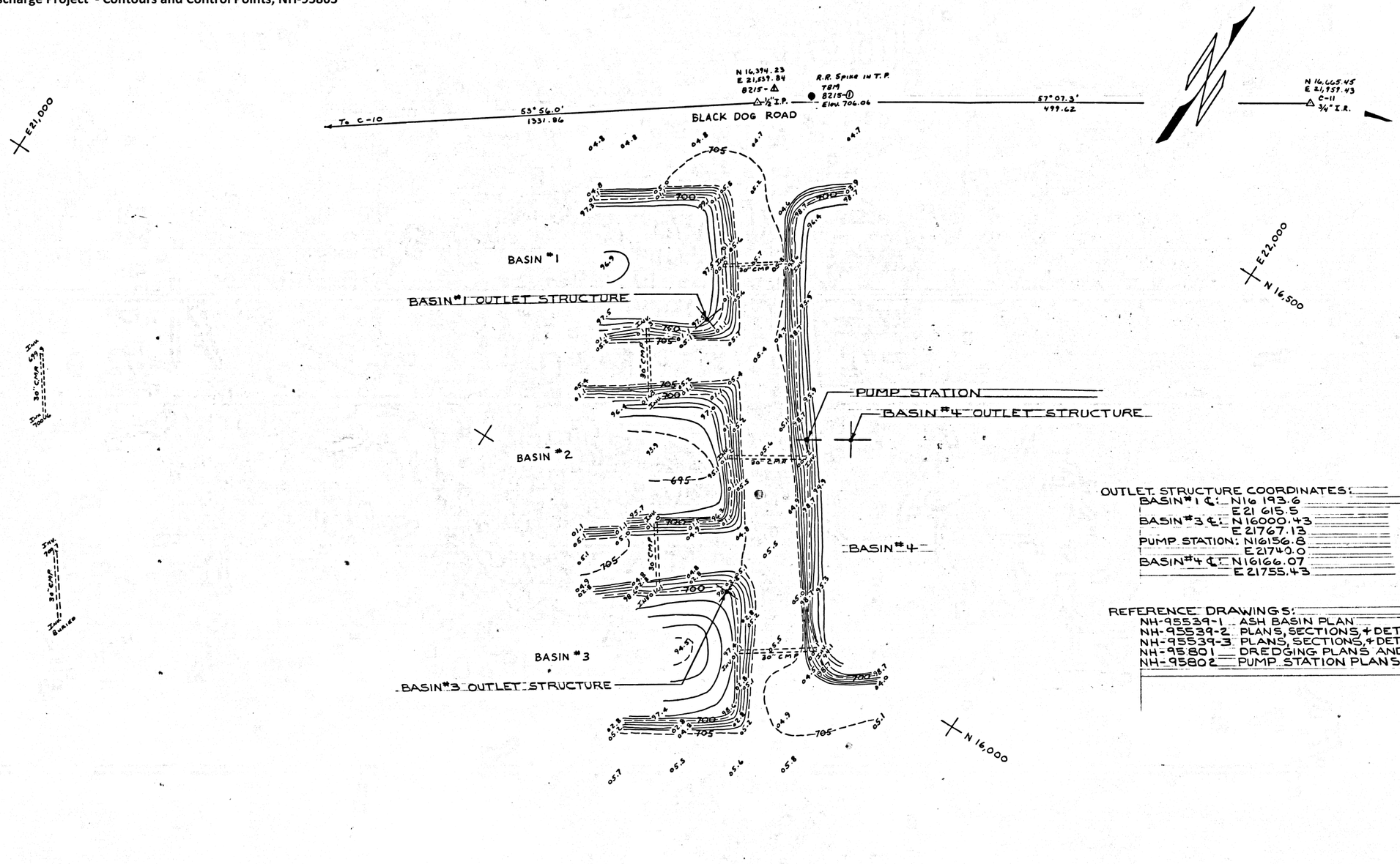
SHEET 8 OF 8

DWN. M.W. DATE 6/80	SIGNIFICANT NUMBER	8230		53	100		4500
CHECKED D.A.S.	School					3000	
PROJ. NO. E-80BK01		1	2	3	4	5	6
APP'D & CERT. Glen S. Bengtson 6/5/80	BLACK DOG GENERATING PLANT ASH POND ZERO DISCHARGE PROJECT OUTLET STRUCTURE- POND #4						
FILMED 6-17-80	NORTHERN STATES POWER COMPANY ENGINEERING DEPARTMENT MINNEAPOLIS	SCALE AS SHOWN			REV. ⚠ 12/31/80 G.S.B.		
		NF-91925					

NF-91925

8031-2-CD/15

Document 4: Ash Pond Zero Discharge Project - Contours and Control Points, NH-95803



OUTLET STRUCTURE COORDINATES:
BASIN #1 ℄: N16 193.6
E21 615.5
BASIN #3 ℄: N16000.43
E21767.13
PUMP STATION: N16156.8
E21740.0
BASIN #4 ℄: N16166.07
E21755.43

REFERENCE DRAWINGS:
NH-95539-1 ASH BASIN PLAN
NH-95539-2 PLANS, SECTIONS, + DETAILS
NH-95539-3 PLANS, SECTIONS, + DETAILS
NH-95801 DREDGING PLANS AND SECTIONS
NH-95802 PUMP STATION PLANS, SEC, + DETAILS.

SCALE IN FEET
0 25 50 100

NOTE
HORIZONTAL AND VERTICAL CONTROL ARE IN BLACK DOG PLANT DATUM.
SURVEY TAKEN 5/21/82 BY JOHN W. GORMAN, INC.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota
Date 8-17-82 Reg. No. 19922
James H. Richter

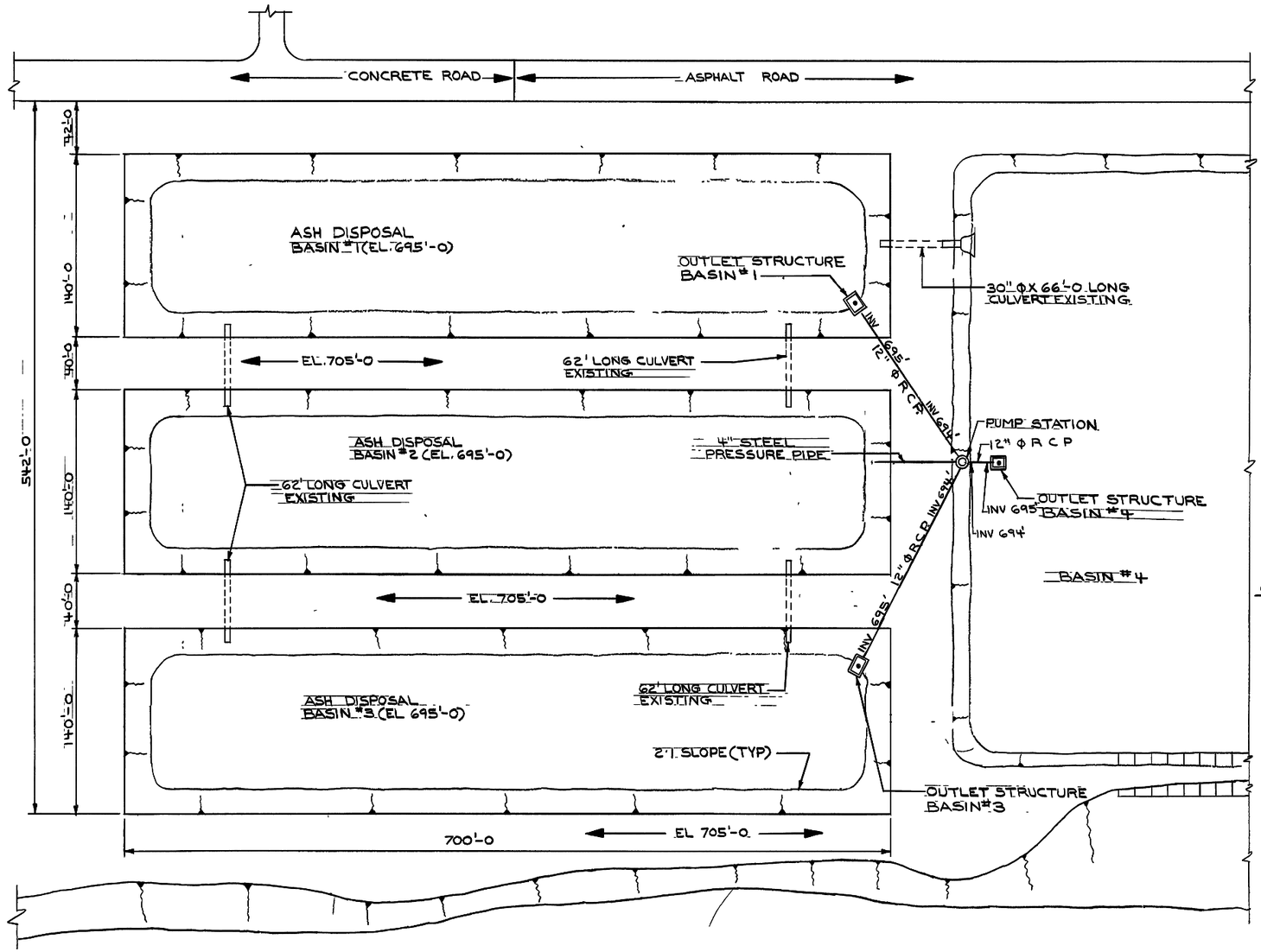
DWN. E.E.C. DATE 5/24/82	SIGNIFICANT NUMBER	8230		950	100	C0002 6230		
CHECKED JLR	GROUP	1	2	3	4	5	6	
PROJ. NO. E-80BK01	BLACK DOG, GEN. PLT. BURSVILLE, MINN.							
APP'D. & CERT. J.H. Boucher, J.L. Knight	ASH POND ZERO DISCHARGE CONTOURS AND CONTROL POINTS							
FILMED 9-3-82	NORTHERN STATES POWER COMPANY MINNEAPOLIS	SCALE AS SHOWN	REV.	NH-95803				

REVISIONS

NH-95803

82-15

Document 5: Ash Pond Zero Discharge Ash Basin Plan, NH-95539-1



ASH BASIN PLAN
SCALE: 1=50'-0

GENERAL NOTES

1. ALL STEEL TO BE A36 EXCEPT AS NOTED.
2. REINFORCING SHALL CONFORM TO ASTM A615 GR60.
3. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185.
4. REINFORCING BARS SHALL BE PLACED TO PROVIDE 3 INCHES OF COVER WHERE CONCRETE IS PLACED AGAINST THE GROUND AND 2 INCHES OF COVER ELSEWHERE UNLESS OTHERWISE SHOWN, OR NOTED.
5. SPLICES IN REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 40 DIAMETERS OF THE SMALLER BAR
6. GALVANIZING SHALL BE AS PER ASTM A123 78
7. CONTRETE COMPRESSIVE STRENGTH 4000 PSI
8. CHAMFER EXPOSED EDGES 1 INCH UNLESS OTHERWISE SHOWN
9. SLUICE GATE SHALL BE ATTACHED AS PER MANUFACTURER S RECOMMENDATIONS.

REVISIONS

A	AS BUILT-ASH POND #4 CULVERT REPAIRS AS PER DRF BD88121 DWN: K. K. 8-23-88 CHKD: JDS 9-16-88 PROJ#: 88D030 FILMED: 11-7-88
B	AS BUILT- REMOVED CULVERTS FROM PONDS 2 & 3 (2002 PROJECTS) PER DWS BDS-10-048 DWN: BC 6/16/10 CHK'D: PARIS PROJECT #: FILMED: JULY 2010

OUTLET STRUCTURE WORKING PT. COORDINATES

BASIN #1 ℄ N16193.6 E21615.5
BASIN #3 ℄ N16000.43 E21767.13
PUMP STATION N16156.8 E21740.0
BASIN #4 ℄ N16166.07 E21755.43

SEE SHT. NH-95803 FOR COORDINATE LOCATIONS.

REFERENCE DRAWINGS

NH-95539-2 PLANS, SEC + DTLS.
NH-95539-3 PLANS, SEC + DTLS.
NH-95801 DREDGING PLANS & SEC.
NH-95802 PUMP STATION PLANS, SEC + DTLS
NH-95803 CONTOURS AND CONTROL POINTS.

NOTE:

1. HORIZONTAL AND VERTICAL CONTROL ARE IN BLACK DOG PLANT DATUM
2. FOR DETAILS ON BASIN #4 CULVERT ENDS, SEE NH-95801

WORKING POINT

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota
Date 8-17-82 Reg No. 14979
James W. Prischa

This map / document is a tool to assist employees in the performance of their jobs. Your personal safety is provided for by using safety practices, procedures and equipment as described in safety training programs and manuals.

SIGNIFICANT NO.	8230		950	100	5200	
GROUP	1	2	3	4	5	6

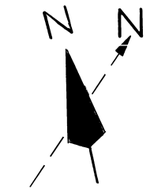
DWN TEM/BM DATE 6-22-82
CHECKED JLK
PROJECT NO. E-80BK01
APP'D & CERT. J. Prischa, S. L. Knight
FILMED 7-8-82

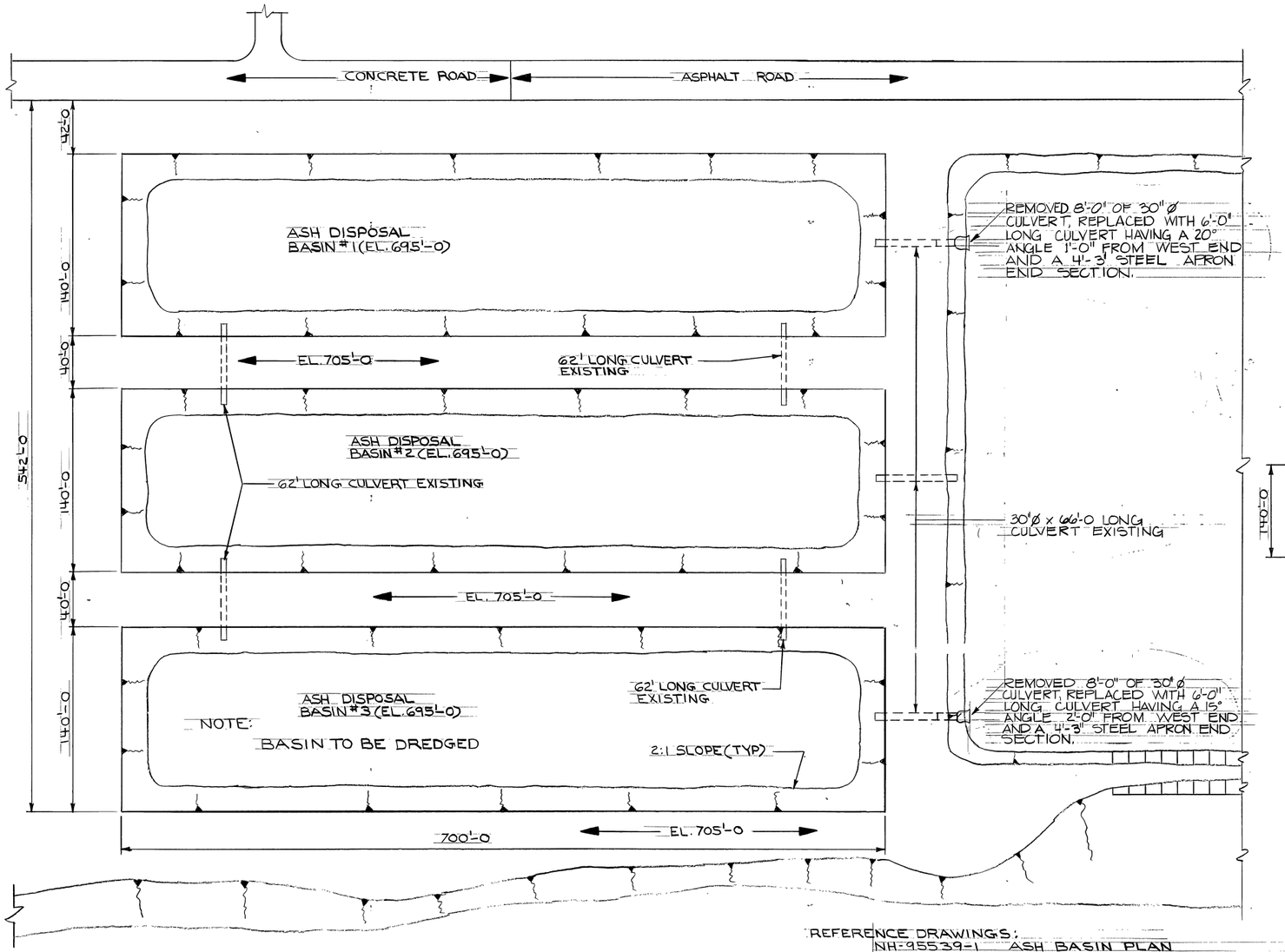
ASH POND
ZERO DISCHARGE ASH BASIN
PLAN

NORTHERN STATES POWER COMPANY
Xcel Energy
BLACK DOG GENERATING PLANT
BURNSVILLE, MINNESOTA

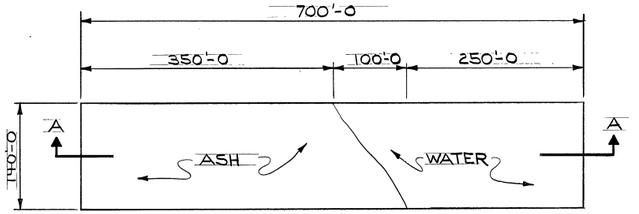
SCALE NOTED REV B
NH-95539-1

Document 6: Ash Pond Zero Discharge Ash Basin - Dredging Plans and Sections, NH-95801

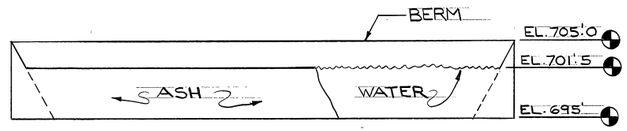




ASH BASIN PLAN
SCALE: 1"=50'-0



PLAN ASH BASIN #3 (EXISTING CONDITIONS)
SCALE: 1"=100'-0



SECTION A-A
VERT. SCALE: 1"=100'-0
HORZ. SCALE: 1"=10'-0

NOTE:
DIMENSIONS SHOWN ARE APPROXIMATE

REFERENCE DRAWINGS:

NH-95539-1	ASH BASIN PLAN
NH-95539-2	PLANS, SECTIONS, + DETAILS
NH-95539-3	PLANS, SECTIONS, + DETAILS
NH-95802	PUMP STATION PLANS, SEC. + DTLS.
NH-95803	CONTOURS AND CONTROL POINTS.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota
Date 8-17-82 Reg. No. 14979
James K Peicius

REVISIONS
A AS BUILT- ASH POND #4 CULVERT REPAIRS AS PER DRR# BD-88-121
DWN: K.K. 8-29-88
CHK'D: JDS 9-16-88
PROJ#: 88D030
FILMED: 11-11-88

NO. REV. ____ INITIAL ____ DATE ____
REVISED BY ____ DATE ____
FOREMAN ____ DATE ____

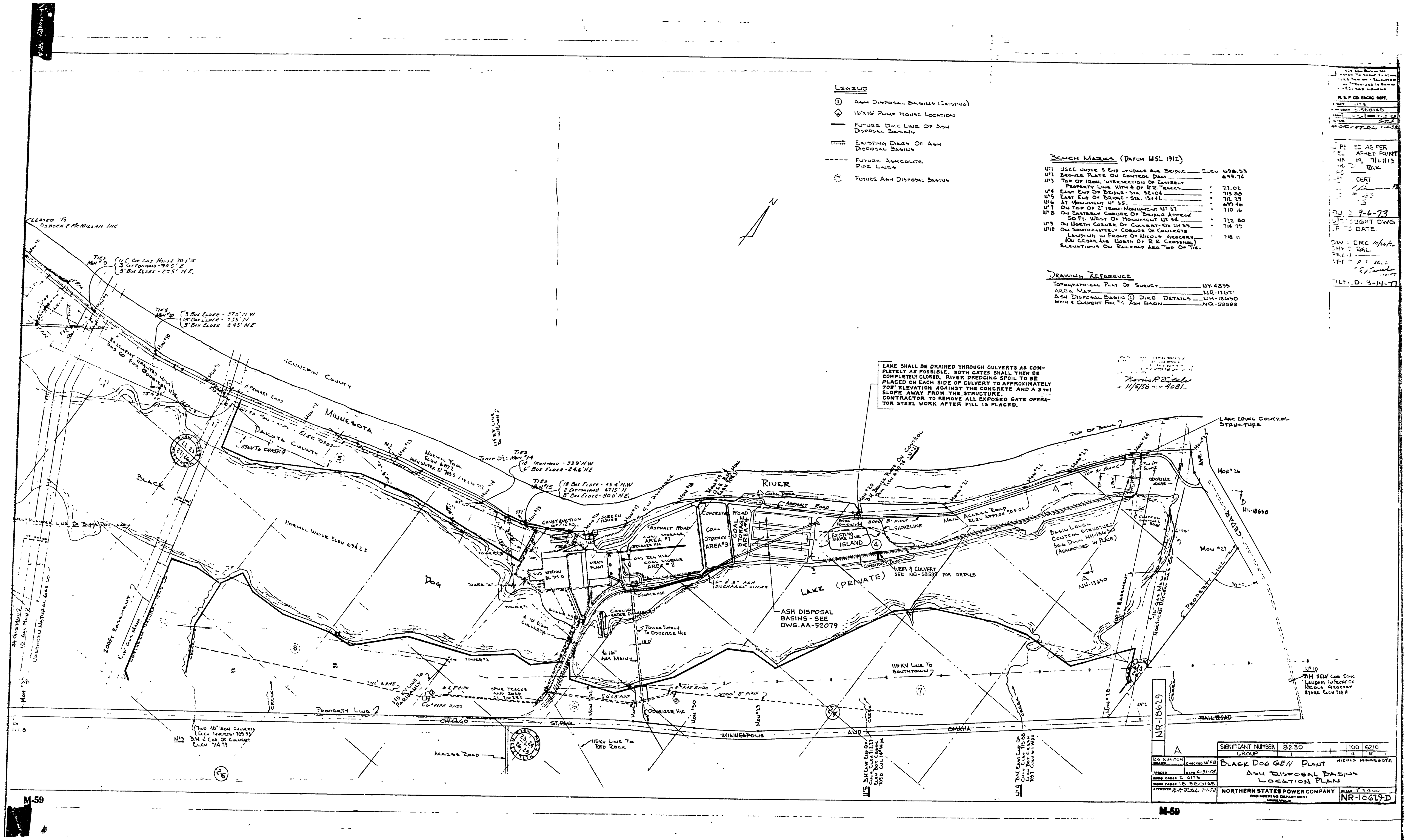
NH-95801

DWN: [illegible] DATE 8/4/82	SIGNIFICANT NUMBER	8230			100	6250	
CHECKED JLK	GROUP	1	2	3	4	5	6
PROJ. NO. E-80BK01	BLACK DOG GEN. PLT. BURNSVILLE, MINN.						
APP'D. & CERT. JJP Peicius, JL Knight	ASH POND ZERO DISCHARGE ASH BASIN DREDGING PLANS AND SECTIONS						
FILMED 9-3-82	NORTHERN STATES POWER COMPANY MINNEAPOLIS	SCALE NOTED	REV. A				
		NH-95801					

NH-95801

TELEDYNE POST N07718

Document 7: Ash Disposal Basins Location Plan, NR-18629D



Xcel Energy℠

MEMORANDUM

Date: 4/8/2008

To: Jon Lahti; Dan Watts; Barry Peterson; Chris Keefe; Tom Leverentz

From: Jim Bodensteiner

Reference: NPDES Permit #MN0000876
Final Permit
Conditions, Requirements, and Submittals Reminder

Enclosed is the reissued NPDES Permit (#MN0000876) for the Black Dog Generating Plant. Please review and have other appropriate personnel review the permit thoroughly to ensure compliance with all conditions of the permit. The permit incorporates language and conditions for discharges (and the intake) associated with Clean Water Act Section 316 past and recent studies. The permit incorporates languages and conditions associated with our requested cooling lake thermal discharge springtime and flood overflow allowances. The MPCA addressed major comments/items identified in our comment letters in February and March. Some significant changes from the plant's former permit include the following:

Incorporation of the thermal discharge energy emergency clause;

Significant relief of springtime constraint/derates with a differential temperature allowable up to 15 F when river flows are above 8000 cfs in March-May. Please advise ES when such conditions arise and we will provide a courtesy notice for the first implementation of the higher differential. You may want to document avoided derates that had occurred about annually;

Significantly reducing ash pond area monitoring with the potential elimination of seep locations and the reduction in the frequency to once per year;

A starting point for a minimum cooling lake outlet flow threshold at 5 MG, but only in March and April;

Incorporation of flood overflow language utilizing the most current elevation triggers provided by the plant;

Incorporation of both the general industrial stormwater permit and the SDS dredge operation permit into the one site NPDES permit;

A mercury minimization plan tailored in accordance with our comments/concerns;

A phosphorus management plan tailored in accordance with our comments/concerns. Phosphorus monitoring is to be conducted at least monthly on SD-005 (ash pond) discharges. Therefore, please plan accordingly with Chestnut lab for sampling and analyses for the next pond batch discharge.

Requirement to develop conceptual plans for addressing impingement mortality/entrainment, with an extension to file 24-months post-issuance, i.e. March 24, 2010.

Besides monthly DMRs (discharge monitoring reports) due to ES by the 18th of each month, below is a synopsis of other report, data or plan submittal deadlines:

Limits and Monitoring Matrix

Continue present monitor including mercury (plant, lab& ES)

Add phosphorus to SD005 monitoring---presently, with 1st pond release and then monthly when releases are conducted. (plant&lab)

Chapter 1: Parts 4.3 and 4.6

Ash Pond Area Water Quality Monitoring

Annual Report----------February 15 (ES)

Detailed Analysis of Monitoring to Date----------June 24, 2008 (ES)

Chapter 3: Part 6 and Chapter 9 Part 1.48

Application for Permit Reissuance

Priority pollutant monitoring-------between September 24, 2011 and June 24, 2012 (ES&lab)

File application for renewal---------- September 24, 2012 (plant&ES)

Chapter 4: Part 2.10 (or part 6)

Energy Emergency

Biological Monitoring Plan----------April 23, 2008 (ES)

Chapter 4: Part 4.8

316(b) Compliance

Impingement mortality and entrainment reduction plan----------March 24, 2008 (plant&ES)

Chapter 5

Storm Water Pollution Prevention Plan (SWPPP)

Initiate bimonthly inspections (non-frozen conditions): April, June, August, October (plant)

Update and submit most current version of industrial SWPPP-----September 19, 2008 (plant)

Start and maintain log of dust suppressant usage that may runoff (Part 8)-prior to use (plant)

Annual Report (including Chemical Dust Suppressant Report------March 31 (plant)

Chapter 6

Dredged Material Management

Characterize sediment & file results with MPCA-prior to dredge project start (plant,ES&lab)

Determine temporary storage and re-use or disposal options, secure necessary reviews for approval----prior to dredge project start (plant&ES)

Site Inspections---prior to initial placement then monthly and within 24 hours of rain events

Annual Report (even if no projects during year)--complete and file with ES by 01/10 each year, starting 01/10/09 (plant)

Chapter 7

Mercury Pollutant Minimization Plan

Continue quarterly monitoring of background river and pond effluent (lab and ES)

Minimization plan with past/future reduction measures----March 24, 2010 (plant, lab&ES)

Implement plan's future reduction measures----------by March 24, 2013 (plant)

BLACK DOG GENERATING PLANT		**PMD – 7.7**
Plant Management Directive		**Revision: 1**
TITLE:	***Storm Water Pollution Prevention Plan***	Page 1 of 25

1.0 Document History

This document was prepared for and is retained at
Northern States Power Company d/b/a Xcel Energy
Black Dog Generating Plant
1400 Black Dog Road
Burnsville, MN 55337

Initial Issue: November 2, 1993
Revised: March 23, 1998
April 1, 1998
May 27, 1999
February 8, 2000
March 8, 2000
April 4, 2000
May 8, 2000
June 19, 2001
June 20, 2001
March 20, 2002
April 25, 2003
July 01, 2004
December 27, 2005
July 30, 2010

2.0 Site Maps

The following documents site maps are included for this document:

Note: These figures are located in the Black Dog Emergency Procedures Plan

Figure 1 Site Layout Black Dog Emergency Plan, SWPPP

Figure 3 Drainage Map Black Dog Emergency Plan, SWPPP

3.0 Description of Potential Pollutants – Material inventory

This section identifies all significant materials stored, handled, managed, processed, fabricated, manufactured, transported, or transferred at the facility. The drainage area for the material is described. Those materials that are exposed or if their storage container is exposed to precipitation a best management plan (BMP) ID number is given in the right hand column. The ID number is used in section 4.0 to identify the material. Refer to section 4.0 for existing controls in place to prevent storm water contamination for exposed materials.

Table 1 – Oil Containers/ Operational Equipment/ Outside Storage & Load/ Unload Areas

Contents	Tank #	Volume (gal)	Location	Containment	Controls	SWPPP BMP #
Diesel fuel unloading	20, 21	2 x 4750	Transfer connection outside SE corner of plant, tank inside bldg.	Dirt area with runoff to plant pond system	Visual monitoring during filling	2
Diesel fuel unloading	27	270	Transfer connection inside Screen house bldg	Building, fill line connection is inside spill bucket.	Visual monitoring during filling	2
Diesel fuel (UST) & unload/ fueling	387	10,000	N of Dumper Bldg and W of Switch Engine Bldg.	Dirt, grass, soil. Area runoff goes to plant pond system via yard runoff sump	ATG on the tanks. Also leak testing & cathodic protection	3
Gasoline (UST) & unload/ fueling	388	1000	NE of 3/4 stack, scraper fuels E of Dumper, locomotive SE end			3
Barrel/Tote delivery of oils	NA	Totes/ drums	SW corner of the plant, brought inside plant	Runoff to parking area, which drains to plant pond system	Materials loaded inside	4
Barrel/Tote delivery of misc. chemicals	NA	Totes/ drums	SW corner of the plant, brought inside plant, Dust suppressant used in coal conveyors	Runoff to parking area, which drains to plant pond system	Materials loaded inside	4
Dust suppression Chemical unloading	4062	6000	Transfer connection on behind scraper garage	Tank inside concrete containment. Runoff to drains to plant pond system	Visual monitoring during filling	5
Caustic unloading	25	4600	Transfer connection SE corner of plant, tank inside bldg	Runoff to parking area, which drains to plant pond system	Visual monitoring during filling	6
Sulfuric Acid unloading	24	5000	Transfer connection SE corner of plant, tank inside bldg	Runoff to parking area, which drains to plant pond system	Visual monitoring during filling	6
28% Aqueous Ammonia unloading	2591	20,000	Transfer connection NE corner of plant, tank inside bldg	Runoff to parking area, which drains to plant pond system	Visual monitoring during filling	7
Liquid Propane gas unloading	NA	30,000	Transfer connection SE corner of plant	Runoff to parking area, which drains to plant pond system	Visual monitoring during filling	8
Softner Brine Tank dry unloading	NA	2000	Transfer connection NE corner of plant,, adjacent to wall	Runoff to parking area, which drains to plant pond system	Visual monitoring during filling	9

Contents	Tank #	Volume (gal)	Location	Containment	Controls	SWPPP BMP #
Scrap Metal and Waste Debris	NA	Dumpsters	NE corner of plant	Runoff to parking area, which drains to Minnesota River.	Waste kept in dumpsters	10
Waste oil Pickup	NA	varies, Tanker truck	Plant waste oil room, scraper garage	Waste oil pumped inside plant bldgs	Oils pumped inside on concrete floor	11
Coal and coal fines	NA	Coal pile	East side of plant and coal haul road	Runoff leads to plant pond system	Asphalt surfaces periodically swept	12
Bottom ash	NA	Truck loadout	East side of main plant bldg.	Partially enclosed, runoff leads to plant pond system	Partially enclosed, area swept	13
Flyash	NA	Tanker truck loadout	East side of main plant bldg.	Partially enclosed, runoff leads to plant pond system	Partially enclosed, area swept	13

Table 2–Mineral Oil-Filled Electric Equipment

Description	Volume (gal)	Location / Other Info.	Containment Description	Containment Sizing	SWPPP BMP #
#1 Res Sta Aux Transformer (Alstom)	2600	Outdoors on west side of plant, transformer pad	Concrete containment around each unit with drains that are plugged except when emptying stormwater. Discharges to ash sump, but valving on discharge line permits diversion of oil to drums.	41.5’ x 27.5’ x 1’ , 8,500 gal	1
#2 Gen Transformer (Alstom)	9000			31’ x 22.5’ x 2.25’ , 11,700 gal	
#2 Res Sta Aux Transformer (West)	5,523			25’ x 21‘ x 3’, 11,400 gal	
#3 Gen Transformer (Farrant)	8,530			38’ x 22’ x 3’ 18,750 gal	
#4 Gen Transformer (Waul)	14100			42.5’x29.5’x3’ 28,100 gal.	
#5 Gen Transformer (Alstom)	11100			35’x3’x2’ 15,700 gal.	
#21X & 21Y Sta Aux. Transformers (ME)	2 x 1110			20’x15.75’x1.5 3,500 gal.	
#31 Sta Aux. Transformer (ABB)	1360			18’ x 15.75‘ x 1.25‘ , 2,650 gal	
#41 Sta Aux. Transformer (ABB)	2160			25.4‘ x 21.25’ x 1.5‘ 6,080 gal	

Table 2–Mineral Oil-Filled Electric Equipment

Description	Volume (gal)	Location / Other Info.	Containment Description	Containment Sizing	SWPPP BMP #
#2 Precip Transformers (GE)	3 @ 140, 3 @ 87	Indoors	Plant concrete floors and walls	NA	NA - Indoors
#3 Precip Transformers (NWL)	6 @ 140				
#4 Precip Transformers (NWL)	5 @ 140				
#2 Precip Transformers (GE)	3 @ 140, 3 @ 87	Outdoors E side of plant.	Yard Drainage System	NA	1
#3 PrecipTransformers (NWL)	6 @ 140				
#4 Precip Transformers (NWL)	6 @ 140				
#111 Yard Aux Transformer	250	W side Breaker Bldg.			
#112 Yard Aux Transformer (Penn)	250				
#114 Transformer (A/C)	162				
Coal Dock Service Transformer (Old Tr 114) (Penn)	300	On S wall of Breaker Bldg,			
Oil circuit breakers (3 containers per unit)	14 x 3@1060	Substation	Gravel and mostly bermed substation	NA	1
115 KV PT's	2x100				
Spare transformer #1 (old #3GSU)	5900		Sand/ poly containment along with substation gravel	26'x29'x0.75 4,230 gal.	
Spare transformer #2 (old 32 MSA)	1765			15.5'x12'x1.3' 1,850 gal	

Table 3 – Indoor Oil Containers/ Operational Equipment

Contents	Tank #	Volume (gal)	Location	Containment	Controls
Diesel Fuel	20, 21	2 x 4750	U4 Oil Room, Mez level, SE corner of plant	Concrete floors & walls (12,000 gal)	Hi/Lo level alarm
Diesel Fuel	1099, 1100	2 x 300	Emergency generator room SW corner of plant (main flr)	Floor & walls of room. Filled by indoor piping from 20, 21	Hi/Lo level alarm
Diesel Fuel	27	270	Indoors on 2nd fl of Screenhouse.	Double walled w/ interstitial monitor. Pan under pump.	Level & leak sensors w/ alarm
Turbine Oil (Makeup)	478	1200	U2 Oil Room, NE corner of plant, Mez level	Concrete room, (18,800 gal)	Sight glass
Turbine Oil (Rest)	814	4700			
Turbine Oil (Rest)	815	2700			
Turbine Oil	477	3000	U2 turbine oil reservoir (Mez)	Plant concrete floors and walls. Sumps in basement	Pressure, temperature & level sensors w/ alarms in control room.
Turbine Oil		380	U2 turbine filter (bsmt)		
Turbine Oil		2 x 100	U2 turbine oil coolers (Mez)		
Hydraulic Oil		200	U2 turbine control skid (mez)	Plant concrete floors and walls. Sumps in basement	Pressure, temperature & level sensors w/ alarms in control room.
Turbine Oil		60	U2 seal oil skid (bsmt)		
Turbine Oil	813	3000	U3 turbine oil reservoir (Mez)		
Turbine Oil		2 x 100	U3 turbine oil cooler (Mez)		
Turbine Oil		180	U3 turbine oil filter (bsmt)		
Turbine Oil	475	3000	U4 turbine oil reservoir (bsmt)		
Turbine Oil		2 x 100	U4 turbine oil coolers (bsmt)		
Turbine Oil		250	U4 turbine oil cond skid (bsmt)		
Turbine Oil	1764	5600	U5 turbine oil reservoir (mainflr)		
Hydraulic Oil		130	U5 turbine control skid (Mez)		
Lube Oils	NA	12 drums	Various loc in bsmt,		NA

Table 3 – Indoor Oil Containers/ Operational Equipment

Contents	Tank #	Volume (gal)	Location	Containment	Controls
Used Oil	22,23	2x 730	#1 Oil Rm. Mez level. NE corner of plant.	Concrete room. (1000 gal)	Sight stick
Lube Oils	NA	15-20 drums			NA
Lube Oil	NA	2 x 55	Gas Compressor Building	Building provides containment	Sight glass
Lube Oil	NA	4 drums			NA
Used Oil	NA	180		Containment pan under tank.	Level sensor w/ alarms
Lube Oils	NA	15 -20 drums.	#3 Oil Room, Mez level	Concrete floors & walls of oil room or building	NA
Lube Oils	NA	15-20 drums	Yard Oil Room		NA

Table 4 - Spill & Emergency Supplies

Spill Response and Cleanup Equipment	
Item	**Location/Comment**
Spill response Kits	Staged in various areas around plant (Oil room, Scraper garage, Turbine floor, Oil room
Sorbent booms, pad, sheets, sweeps	3-4 Common Stack
Empty Drums	3-4 Common Stack
Floating boom with curtain	3-4 Common Stack
Rakes, shovels, pumps, etc.	Locker Behind the Elevator on Turbine level.
Front-end loader	Yard, #3 Euclid Garage
Boats – one pontoon, one aluminum boat	Under Stock Room
Fire Response Equipment	
Diesel fire pump	Screen House
Portable Fire Extinguishers	Throughout site - 152 Dry Chemical, 36 Halon, 6 CO2, 5 Water
CO2 System	Unit #5
Fire Hydrants	Yard
First Aid Supplies	
First Aid Kits	Throughout site
Chemical Showers	Around the pump room.
Eye Wash Stations	Various locations around the plant. Mainly the pump room and the turbine level.
Combustible Gas meters	LOTO room and Control Room

4.0 Best Management Practices and Existing Controls

(includes existing controls for exposed materials)

Each of the items with an ID number in section 3.0 is listed along with pertinent information, ie. period of exposure, quantity exposed, location or storage method. This section also lists the best management practices, either non-structural or structural controls to further help prevent storm water contamination and lists existing controls already in place.

The best management practices or existing controls will be amended when needed. If spills or other areas of concerns are identified, more best management practices will be included to address each situation.

At least the following BMPs were considered for development and implementation in this facility's SWPPP.

1) source reduction - preventative maintenance, spill prevention and response procedures, chemical substitution, materials management practices, employee training.

2) containment/diversion - segregating, separating, covering, berming, diverting flow, dust control

3) treatment - oil/water separator, storm water detention pond, recycling

	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(# 1) Plant and substation mineral oil filled electrical equipment.

Located inside and outside the plant bldg and substation yard.

NON-STRUCTURAL CONTROLS & METHODOLOGY

Transformers will be properly operated and maintained.

The plant's Emergency Response Plan and SPCC plan shall be followed to prevent and/or to respond to a spill.

Leaking transformers will not be transferred from the site unless containment is provided or the oil is drained.

Inspections for evidence of leaks or potential releases of oil from damaged/malfunctioning equipment will be performed periodically.

Containment areas will be kept free of debris.

Substation maintenance will be informed of spills discovered by plant personnel.

Spill containment materials are readily accessible in stockroom and stockroom personnel are trained in spill response.

Preventive Measures:
Weekly equipment readings are taken and equipment is visual monitored for abnormalities.

Monthly inspections are performed per plant policy.

Containment areas inspected and drained per operating procedure OC-5.1.1.

STRUCTURAL CONTROLS & METHODOLOGY

Concrete containment is provided for the large transformers on west side. The containment areas are drained as necessary and logged in a containment discharge log stating there is no oil contamination.

The other transformers are within the gravel substation.

The substation is elevated to prevent storm water running onto the area.

The substation is gravel, which allows storm water to infiltrate and if a spill occurs the gravel can be readily removed where necessary.

Vegetation surrounds the borders of the substation that are adjacent to the lake.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(# 2) Fuel oil tanker truck unload

8,800 gallon ignition oil tanks - located inside the plant with a loading pipe at the southeast corner of the plant.

270 gallon fuel oil tank – located inside screenhouse bldg.

NON-STRUCTURAL CONTROLS & METHODOLOGY

The plant's Emergency Response Plan, SPCC plan and MN AST Rules 7151 requirements shall be followed to prevent and/or respond to a spill.

Transfer connections will be inspected prior to transfer.

Plant personnel procedures have been developed for diesel delivery.

Unloading operator will not leave the transfer operation unattended.

Spill containment materials are readily accessible in stockroom and stockroom personnel are trained in spill response.

Preventive Measures:
Inspected monthly per Above Ground Storage Tank program.

Room tanks are located within will contain any leaks.

STRUCTURAL CONTROLS & METHODOLOGY

The tanks are stored inside the plant.

The piping is adjacent to the plant wall, away of storm drains.

Loading pipe is labeled.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. Period of exposure, quantity exposed, location or storage method)

(# 3) Underground storage tanks:

500 gallon gasoline - located near the U3/4 stack.

10,000 gallon diesel fuel tanks - located near the switch engine garage.

NON-STRUCTURAL CONTROLS & METHODOLOGY

The plant's Emergency Response Plan and SPCC plan shall be followed to prevent and/or respond to a spill.

Transfer connections will be inspected prior to transfer.

Unloading operator will not leave the transfer operation unattended.

Dry cleanup methods shall be used in the transfer area.

Employees will be discouraged from "topping off " vehicle tanks.

Fill pipes are covered with plastic drums to prevent water from getting into fuel catchment basin. A plan is in place to raise the fill pipes above grade in 2010.

Spill containment materials are readily accessible in stockroom and stockroom personnel are trained in spill response.

Preventive Measures:
Monthly In-tank and Line Leak Testing preformed per Underground Storage Tank program.

Cathodic tank inspection preformed with vendor every three years.

STRUCTURAL CONTROLS & METHODOLOGY

The two tanks are located underground.

The gasoline dispensing area is located over gravel, within the controlled yard drainage system.

The fuel oil dispensing area is located over concrete and gravel, within the controlled yard drainage system.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(# 4) Stock room loading dock

Located on SW corner of plant.

Drums and totes of lube oils, hydraulic oils, dust suppressant chemicals, sodium hydroxide and other misc chemicals are shipped and received at the loading dock. Materials are brought inside plant and managed appropriately.

NON-STRUCTURAL CONTROLS & METHODOLOGY

Preventive Measures:

Controlled handling by trained personnel.

Spill containment materials are readily accessible in stockroom and stockroom personnel are trained in spill response.

STRUCTURAL CONTROLS & METHODOLOGY

Loading area is asphalt and concrete inside building.

There are no storm drains nearby in loading dock area. Drainage slopes SE to dirt and gravel area.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(# 5) Dust Suppression Chemical Loading

6000 gallon tank- located behind scraper garage near coal yard.

NON-STRUCTURAL CONTROLS & METHODOLOGY

MN AST Rules 7151 requirements shall be followed.

Transfer connections will be inspected prior to transfer.

Unloading operator will not leave the transfer operation unattended.

The transfer area shall be kept clean.

Spill containment materials are readily accessible in stockroom and stockroom personnel are trained in spill response.

Preventive Measures:
Inspected weekly as per Above Ground Storage Tank program.

STRUCTURAL CONTROLS & METHODOLOGY

The tank is within concrete containment.

The transfer connection is located over concrete. The containment area is drained as necessary and logged in a containment discharge log.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(# 6) 5,000 gallon sulfuric acid tank
4,600 gallon sodium hydroxide tank.

NON-STRUCTURAL CONTROLS & METHODOLOGY

MN AST Rules 7151 requirements shall be followed.

Transfer connections will be inspected prior to transfer.

Unloading operator will not leave the transfer operation unattended.

The transfer area shall be kept clean.

Spill containment materials are readily accessible in stockroom and stockroom personnel are trained in spill response.

Preventive Measures:
Inspected monthly per Above Ground Storage Tank program.

STRUCTURAL CONTROLS & METHODOLOGY

The tanks are stored indoors within containment.

Safety shower located nearby.

The transfer area is located over a gravel area with no storm drains nearby.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(#7) 20,000 gallon aqueous ammonia storage tank

Located in ammonia storage room on east side of plant with a loading pipe in the same area on the outside.

NON-STRUCTURAL CONTROLS & METHODOLOGY

The Black Dog Ammonia Risk Management Program Compliance Manual, aqueous ammonia unloading procedure and the MN AST Rule 7151 requirements shall be followed.

Transfer connections will be inspected prior to transfer.

Unloading operators will not leave the transfer operation unattended.

Storm drain is covered during product transfer.

The transfer area will be kept clean**.**

Spill containment materials are readily accessible in stockroom and stockroom personnel are trained in spill response.

Preventative Measures:
Inspected monthly per Above Ground Storage Tank program.

STRUCTURAL CONTROLS & METHODOLOGY

The tank is installed indoors within concrete wall containment.

The transfer area has a concrete pad that is sloped to contain small spills. A large scale spill would overflow concrete containment area and enter the rectangular sump drain near by and drain to the ash water piping system.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(# 8) Softener Brine Unloading

2000 gallon tank- located inside north side of plant with outside loading pipe on north side adjacent to plant wall.

Material is unloaded dry and is blown into tank. Water is added to tank inside.

NON-STRUCTURAL CONTROLS & METHODOLOGY

MN AST Rules 7151 requirements shall be followed.

Transfer connections will be inspected prior to transfer.

Unloading operator will not leave the transfer operation unattended.

The transfer area shall be kept clean.

Any spills that occur can be swept up quickly.

Plant storm drain is protected with fabric bales.

Spill containment materials are readily accessible in stockroom and stockroom personnel are trained in spill response.

STRUCTURAL CONTROLS & METHODOLOGY

The tank is inside the plant.

The transfer connection is located over asphalt surface for easy cleanup.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(# 9) Scrap metal and waste dumpsters and waste/recycle bins

Located outside near the warehouse and by east side ash gate entrance.

NON-STRUCTURAL CONTROLS & METHODOLOGY

Scrap metal and refuse shall be stored in the dumpsters.

Waste materials will not allowed to be stored outside of dumpsters.

Waste materials will not be allowed to contain residual oil or chemicals.

Preventive Measures:
Dumpsters shall include only materials that will be handled appropriately per plant policies.

Dumpsters shall be emptied on a regular basis.

STRUCTURAL CONTROLS & METHODOLOGY

Loading dock area waste bin drainage goes to gravel area with no storm drains nearby.

Ash gate area for waste dumpster storage drains to ash pond system.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(# 10) Waste Oil Pickup

#1 oil room waste oil tanks 2- 730 gallon each, inside NE side of plant

Scraper maintenance garage – waste oil storage in barrels.

NON-STRUCTURAL CONTROLS & METHODOLOGY

MN AST Rules 7151 requirements shall be followed.

Transfer connections will be inspected prior to transfer and is done inside plant.

Unloading operator will not leave the transfer operation unattended.

The transfer area shall be kept clean.

Spill containment materials are readily accessible in stockroom and stockroom personnel are trained in spill response.

Preventive Measures:
Inspected monthly per Above Ground Storage Tank program.

STRUCTURAL CONTROLS & METHODOLOGY

Containment is provided for the tanks inside plant on concrete floor.

Transfer connection piping for loadout is inside plant buildings.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(# 11) Coal.

Located northeast of the plant.

NON-STRUCTURAL CONTROLS & METHODOLOGY

Coal will be kept within the controlled yard drainage area.

Preventive Measures:
Coal handling equipment maintained and operated to meet our fugitive dust plan.

Hard surface areas are swept periodically to control fugitive dust.

STRUCTURAL CONTROLS & METHODOLOGY

The entire coal yard is surrounded by a flood control berm.

Coal yard runoff is directed to the ash settling basins.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(# 12) Ash

Fly ash is stored in a dry storage silo. Bottom ash is primarily sluiced to the bottom ash dewatering bin.

Water overflows to the ash settling basins, east of the plant..

Bottom ash that is sluiced to the ash settling basins is dewatered there.

NON-STRUCTURAL CONTROLS & METHODOLOGY

Ash will be kept within the controlled yard drainage area.

Preventative Measures:
Equipment maintained and operated to meet fugitive dust permit.

STRUCTURAL CONTROLS & METHODOLOGY

Fly ash is loaded into sealed tanker trucks in an asphalt area. A retractable hose is used to fill fly ash into tanker trucks where fugitive emissions are minimized.

Drainage from this area is part of the yard drainage to the ash settling basins.

Bottom ash is unloaded from the bottom ash dewatering bin and shipped to Sherco for disposal or shipped elsewhere for utilization. Bottom ash from the settling ponds is shipped to Sherco.

Drainage from this area is part of the yard drainage to the ash settling basins.

Ash Settling Ponds 1, 2, and 3 are located within a flood control berm.

BEST MANAGEMENT PRACTICES & EXISTING CONTROLS	Last Update: July 1, 2010

EXPOSED SIGNIFICANT MATERIAL OR AREA OF CONCERN
(include information, ie. period of exposure, quantity exposed, location or storage method)

(#13) Sediment erosion.

Located anywhere erosion is occurring.

NON-STRUCTURAL CONTROLS & METHODOLOGY

The site will be inspected every two months during non-frozen conditions and any excessively eroded areas will be identified and repaired.

The inspections are due in April, June, August, and October.

Only one inspection needs to be done while storm water is discharging.

STRUCTURAL CONTROLS & METHODOLOGY

Culverts, storm drains, swales and grading are provided at the facility to provide adequate drainage of storm water to prevent excessive erosion.

5.0 Management and Response Procedures

5.1 PURPOSE:

The purpose of the Storm Water Pollution Prevention Plan is to eliminate any unnecessary contact between storm water and materials. If contact cannot be prevented then means of control are provided. Storm water discharges must be free of pollutants. This plan is designed to meet the requirements of the facility's NPDES General Storm Water Permit.

5.2 APPLICABILITY:

This applies to steam electric generating plant sites. All significant materials at the site need to be listed, all exposed materials must be addressed to provide the best management controls to prevent contaminated storm water discharges.

5.3 CERTIFICATION:

All discharges from the site have been evaluated as non-storm water discharges except those covered by the existing NPDES Permit. The evaluation is based on review of current site drawings & visual site inspection.

5.4 RESPONSIBILITIES:

Management is responsible for the following:

Approval and implementation of the Storm Water Pollution Prevention Plan,

Ensuring the Storm Water Pollution Prevention Plan is reviewed at least once annually, (Maximo PM).

Ensuring that this plan is revised whenever there is a change in materials or materials management practices which may discharge pollutants in storm water,

Ensuring that the plan is revised whenever it is determined that the plan is not controlling the discharge of pollutants in storm water.

Certifying that discharges from the site have been evaluated for the presence of non-storm water discharges and that no non-storm water discharges from the site exist not covered by an NPDES permit.

Ensuring that facility personnel have an adequate understanding of the Storm Water Pollution Prevention Plan and the NPDES General Storm Water Permit.

Identifying the personnel that will be responsible for managing this Storm Water Pollution Prevention Plan, implementation, and reporting requirements. These persons shall be available at reasonable times of operation. Contingencies will be provided so that unanticipated absences do not prevent adequate management of the plan.

Training for appropriate personnel will be provided in the year following new permit issuance.

5.5 RESPONSIBLE INDIVIDUALS:

Management responsible for meeting plan and permit requirements:

Thomas Fallgren (952) 895-4219

Plant Director

Gary Juip (952) 895-4218

Manager of Operations and Maintenance

Daniel Watts (952) 895-4205

Manager of Engineering/Technical Support

Responsible for inspections, documentation and regulatory requirements:

John Chelstrom (952) 895-4268

Environmental Analyst

Spill response procedures are detailed in the Emergency Response Plan.

6.0 INSPECTIONS AND DOCUMENTATION

The site shall be inspected every two months during non-frozen conditions. The inspections are due in April, June, August, and October. Only one inspection needs to be done while storm water is discharging. The inspection shall be conducted for the purpose of determining the maintenance of structural and non-structural storm water management practices. Inspections shall identify any necessary changes to assure adherence to the pollution prevention plan and permit. The inspection report form shall be fully completed.

Inspection forms and the first and second annual report shall be maintained along with a copy of this storm water pollution prevention plan (presently in a binder in Engineering Library).

7.0 Drainage Summary

Black Dog Generating Plant site has one storm drain located near the NE corner of the plant. This drain receives runoff from an asphalt area. The area is swept periodically as needed to keep sand, coal and ash fines from building up near area. This storm drain is also protected with filter media to prevent solids from going to Minnesota River. One other storm drain exists on Black Dog Road near the screenhouse which also drains to the Minnesota River. No materials are stored near this drain.

Drainage Summary:

Transformers adjacent to the plant are within concrete brick containment. Uncontaminated storm water that accumulates within the transformer containment is released to the plant bottom ash pumps. The bottom ash pumps then transport the water to the ash basins.

Substation has infiltration or sheet runoff of storm water.

The east side of the plant has a yard drainage system directing runoff to the ash settling ponds. There, runoff from the coal yard, transfer areas (fuel oil, caustic, sulfuric acid, dust suppression, and gasoline tank), dumpsters, fly ash loading, and access road is directed to the ash settling ponds.

The closed/capped temporary ash storage area runoff goes to pond #4.

Drains at the inactive coal dock, discharge storm water to the ash ponds.

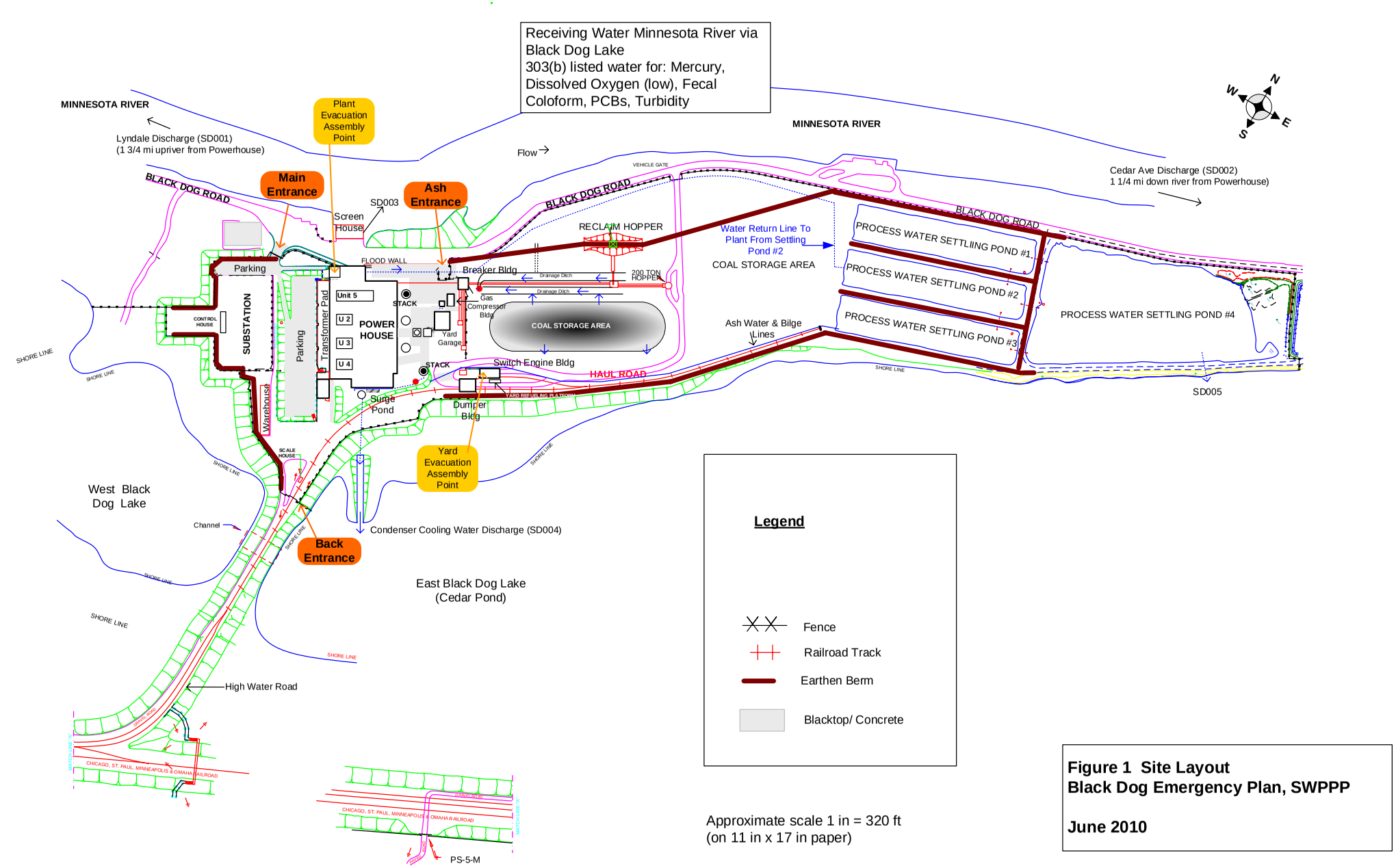
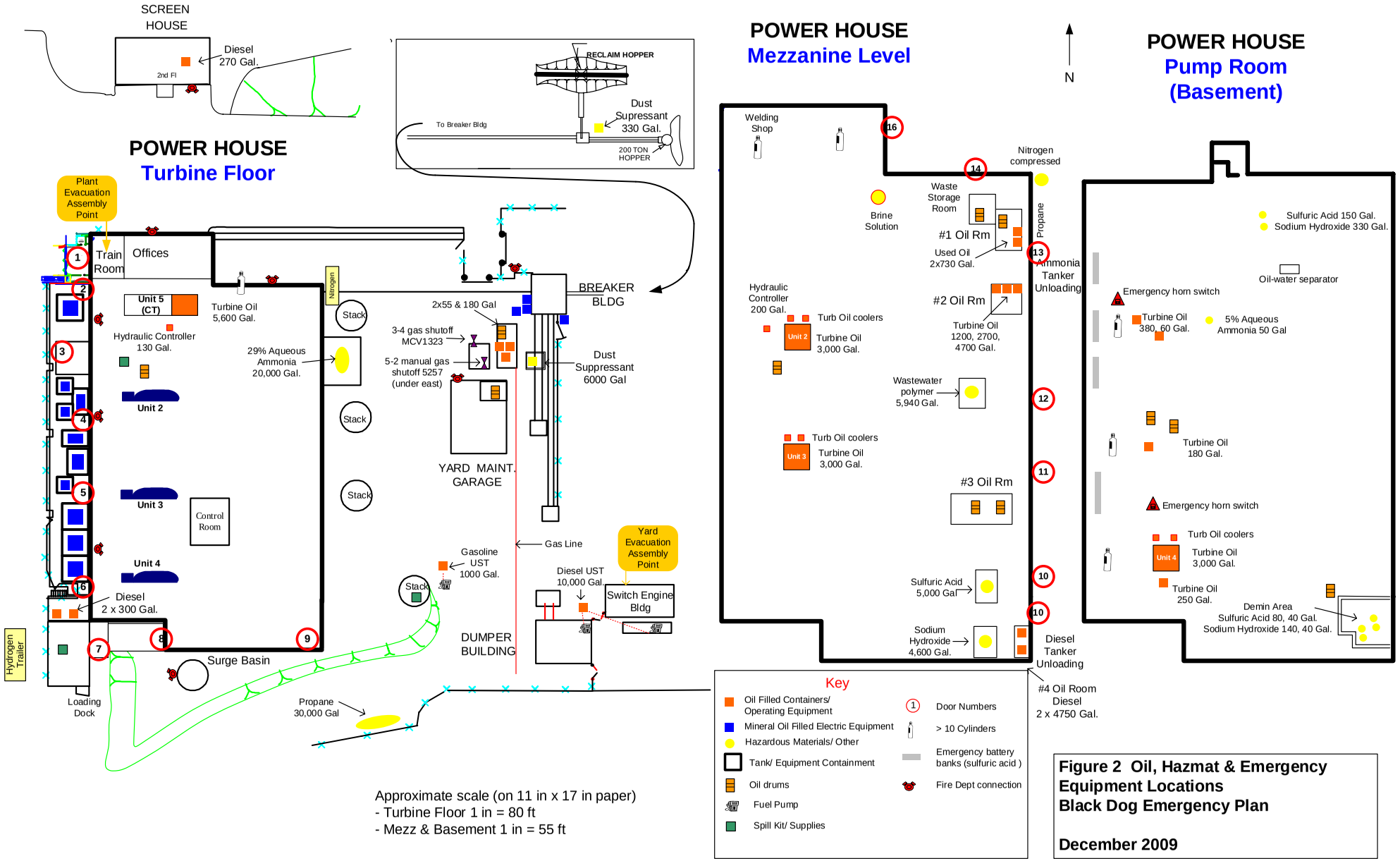


Figure 1 Site Layout
Black Dog Emergency Plan, SWPPP

June 2010



Approximate scale (on 11 in x 17 in paper)
- Turbine Floor 1 in = 80 ft
- Mezz & Basement 1 in = 55 ft

Figure 2 Oil, Hazmat & Emergency Equipment Locations
Black Dog Emergency Plan

December 2009

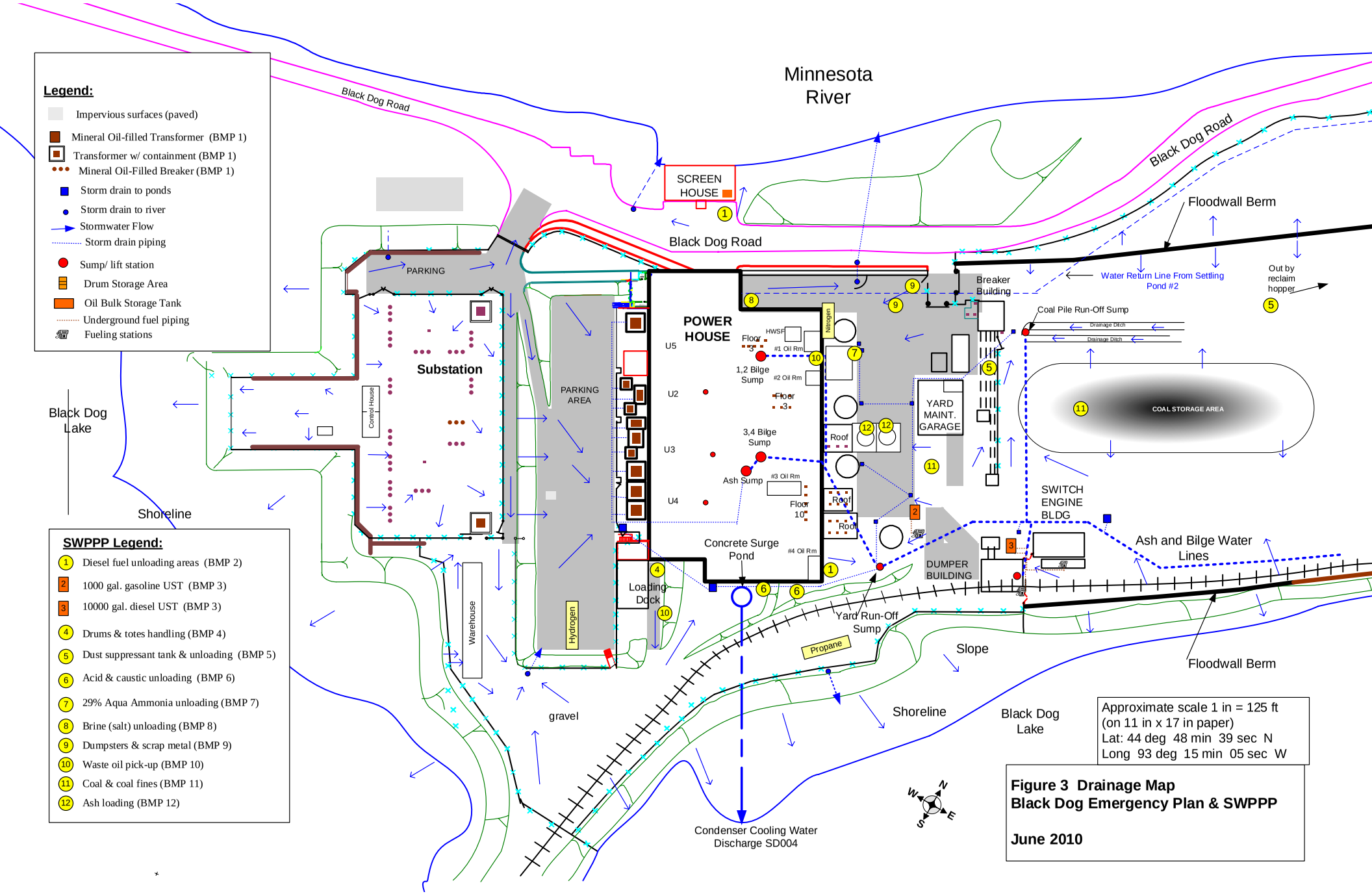


Figure 3 Drainage Map
Black Dog Emergency Plan & SWPPP

June 2010

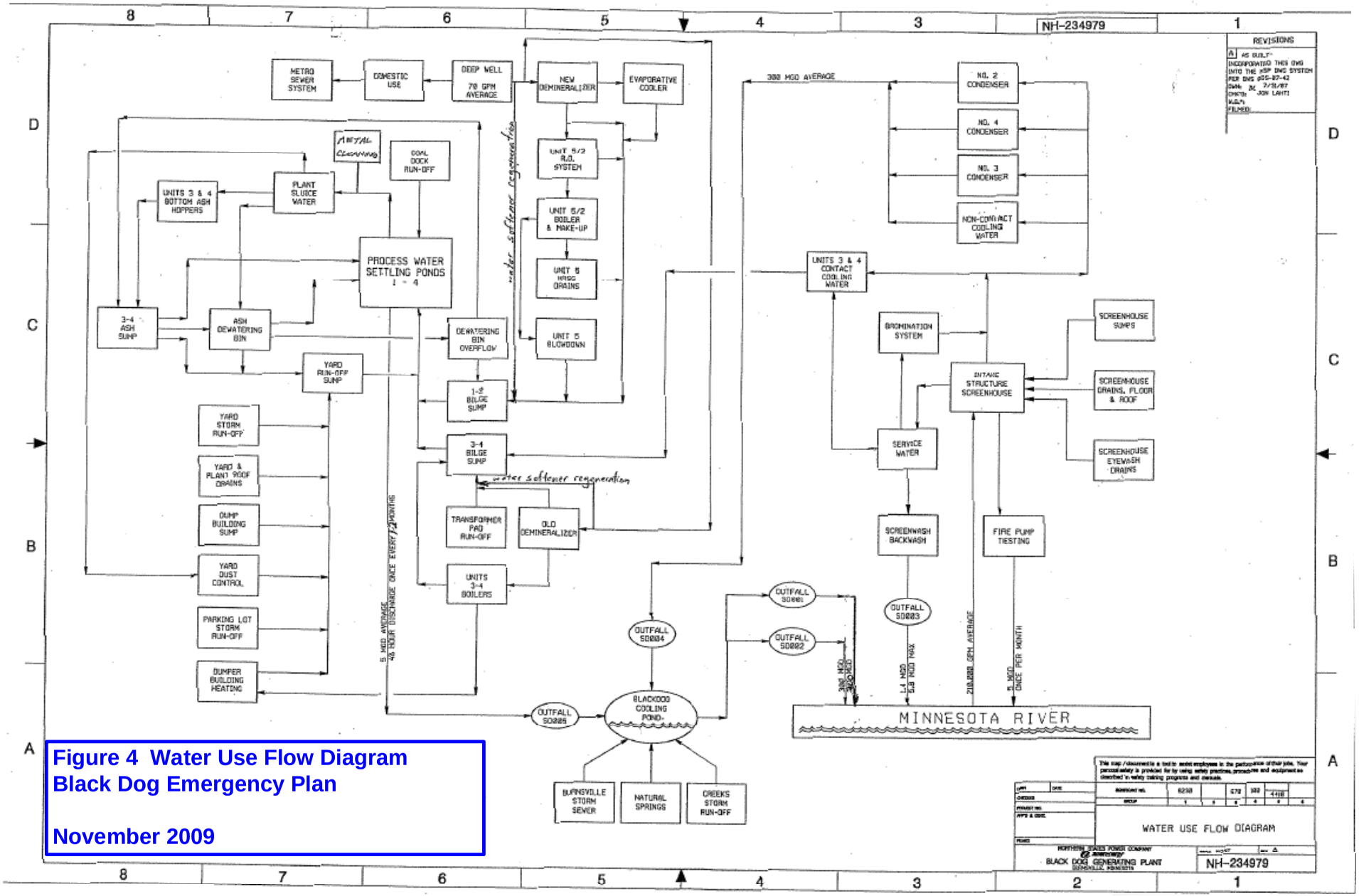


Figure 4 Water Use Flow Diagram
Black Dog Emergency Plan

November 2009

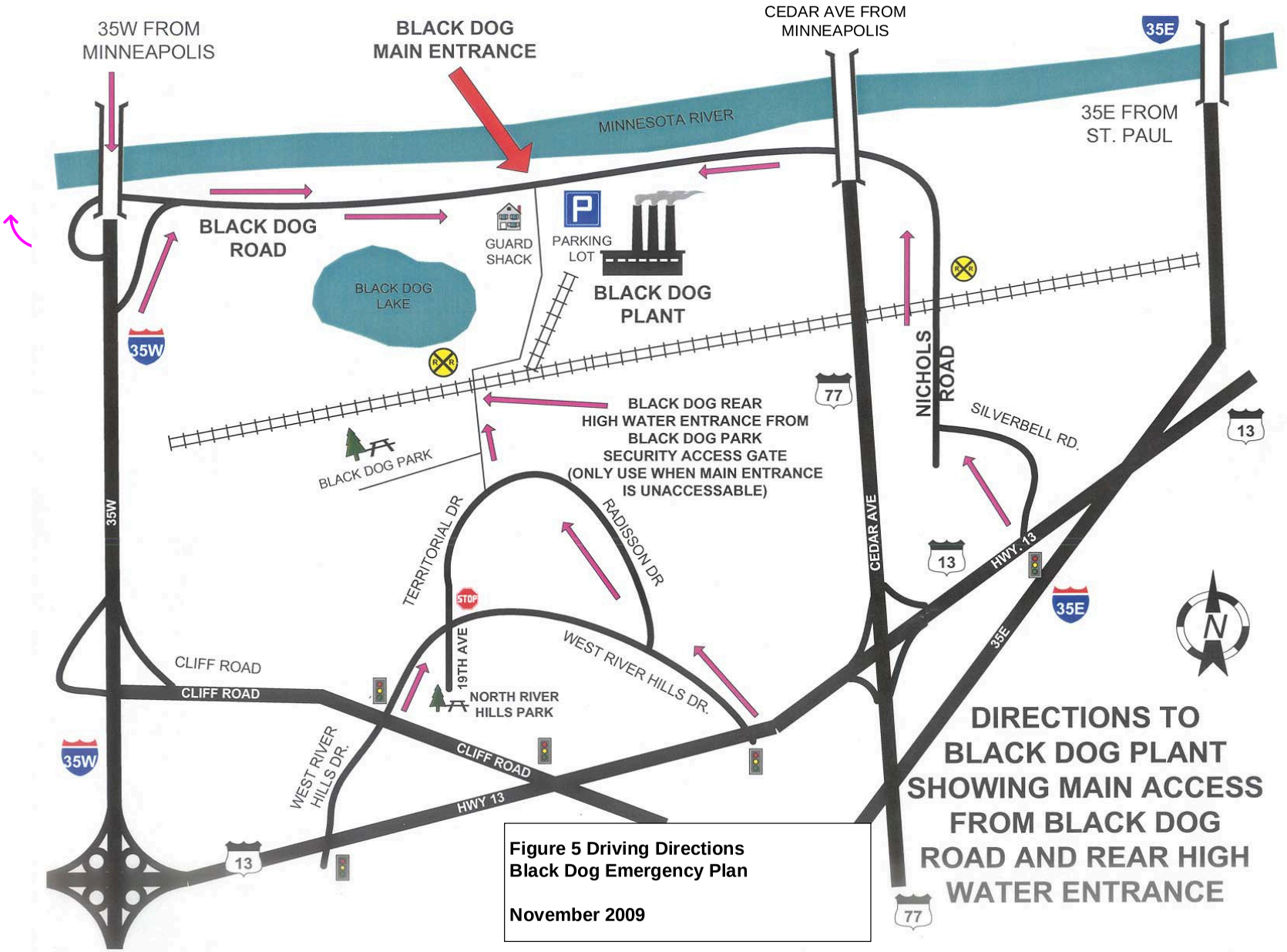


Figure 5 Driving Directions
Black Dog Emergency Plan

November 2009

APPENDIX B
Photographs

Figure 1: Ash Water and Bilge Line Outlet to Process Water Settling Pond # 3

Figure 2: Process Water Settling Pond # 3, Northeast

Figure 3: Process Water Settling Pond # 3, East

Figure 4: Process Water Settling Pond # 3, East

Figure 5: Process Water Settling Pond # 3, North

Figure 6: Process Water Settling Pond # 3, West

Figure 7: Process Water Settling Pond Divide for Ponds #1-#3 and #4, Northwest

Figure 8: Process Water Settling Pond # 4, North

Figure 9: Process Water Settling Pond # 4 Outlet to Black Dog Lake

Figure 10: Black Dog Lake at Process Water Settling Pond # 4 Outlet

Figure 11: Process Water Settling Pond # 4 Inlet to Black Dog Lake

Figure 12: Process Water Settling Pond # 4 Access Ladder for Inlet to Black Dog Lake

Figure 13: Process Water Settling Pond # 4, North

Figure 14: Process Water Settling Pond # 4, Northwest

Figure 15: Process Water Settling Pond # 4, West

Figure 16: Process Water Settling Pond # 4, Southwest

Figure 17: Southeast Corner of Process Water Settling Pond # 2, Northwest

Figure 18: Process Water Settling Pond # 3 and Pond # 2, West

Figure 19: Process Water Settling Pond # 3 Inlet to Process Water Settling Pond # 2

Figure 20: Process Water Settling Pond # 3 Inlet to Process Water Settling Pond # 2

Figure 21: Process Water Settling Pond # 3 Outlet to Process Water Settling Pond # 2

Figure 22: Process Water Settling Pond # 3, South

Figure 23: Process Water Settling Pond # 2, Northwest

Figure 24: Process Water Settling Pond # 2, East

Figure 25: Water Return Line to Plant Inlet from Process Water Settling Pond # 2

Figure 26: Process Water Settling Pond # 2. Northwest

Figure 27: Pump Station at Process Water Settling Pond # 2, Northwest

Figure 28: Water Return Line to Plant Inlet from Process Water Settling Pond # 2

Figure 29: Outlet Pipes to Process Water Settling Pond # 1, North

Figure 30: Process Water Settling Pond # 2 Outlet, West

Figure 31: Process Water Settling Pond # 2 Inlet to Process Water Settling Pond # 1

Figure 32: Process Water Settling Pond # 2 Outlet to Process Water Settling Pond # 1

Figure 33: Process Water Settling Pond # 1 Inlet to Process Water Settling Pond # 4

Figure 34: Process Water Settling Pond # 2, South

Figure 35: Process Water Settling Pond # 1 Inlet to Process Water Settling Pond # 4

Figure 36: Process Water Settling Pond # 1 Inlet to Process Water Settling Pond # 4

Figure 37: Process Water Settling Pond # 1 Outlet to Process Water Settling Pond # 4

Figure 38: Process Water Settling Pond # 4, East

Figure 39: Process Water Settling Pond # 1, West

Figure 40: Black Dog Road and Process Water Settling Pond # 1, West

Figure 41: Process Water Settling Pond # 4 and Pond #1, Northeast Corner

Figure 42: Process Water Settling Pond # 1, South

Figure 43: Process Water Settling Pond #1, East

Figure 44: Black Dog Rd and Minnesota River from Coal Storage Area, West

Figure 45: Black Dog Rd and Minnesota River from Coal Storage Area, North

Figure 46: Black Dog Rd and Minnesota River from Coal Storage Area, North

Figure 47: Black Dog Rd and Minnesota River from Coal Storage Area, Northwest

Figure 48: Black Dog Power Station and Coal Storage Area

Figure 49: Black Dog Rd and Minnesota River from Coal Storage Area

Figure 50: Black Dog Power Station and Black Dog Road from Coal Storage Area

Figure 51: Dry Ash Loading Facility

Figure 52: Bottom Ash Loading Facility

Figure 53: Westside view of Railroad Bridge over Black Dog Lake

Figure 54: Westside view of Railroad Bridge over Black Dog Lake

Site Name:	**Black Dog Generating Plant**	**Date:**	**9-23-2010**
Unit Name:	**Ponds Units 1, 2 ,3 and 4**	**Operator's Name:**	**Northern States Power DBA Xcel Energy**
Unit I.D.:	**Ponds Units 1, 2 ,3 and 4**	**Hazard Potential Classification:**	**High ☐ Significant ☐ Low ☒**
	Inspector's Name:	Cleighton D. Smith, P.E. and Scott C. Clarke, P.E.	

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	1		18. Sloughing or bulging on slopes?		X
2. Pool elevation (operator records)?	2		19. Major erosion or slope deterioration?		N/A
3. Decant inlet elevation (operator records)?	3		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?		X
5. Lowest dam crest elevation (operator records)?	4		Is water exiting outlet, but not entering inlet?		X
6. If instrumentation is present, are readings recorded (operator records)?	N/A		Is water exiting outlet flowing clear?	X	
7. Is the embankment currently under construction?		5	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	6	6	From underdrain?		X
9. Trees growing on embankment? (If so, indicate largest diameter below)	X		At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?		X	At natural hillside in the embankment area?		X
11. Is there significant settlement along the crest?		X	Over widespread areas?		X
12. Are decant trashracks clear and in place?		N/A	From downstream foundation area?		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X	"Boils" beneath stream or ponded water?		X
14. Clogged spillways, groin or diversion ditches?		X	Around the outside of the decant pipe?		X
15. Are spillway or ditch linings deteriorated?		N/A	22. Surface movements in valley bottom or on hillside?		X
16. Are outlets of decant or underdrains blocked?		X	23. Water against downstream toe?	X	
17. Cracks or scarps on slopes?		X	24. Were Photos taken during the dam inspection?		X

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Issue #	Comments
1.	Perimeter flood dike is inspected monthly by operator; otherwise, the earthen embankment between Black Dog Lake and Ponds 3 and 4 are inspected every two months during non-frozen conditions. One of the inspections is performed while stormwater is discharging
2.	CCW pool operating elevations vary between +/- 697 ft to 702 ft for ponds 1, 2, 3 and 4.
3.	+/- 695 ft
4.	+/- 705.0 along southern perimeter embankment between Black Dog Lake and Pond 4
5.	The only earthen embankment occurs between Black Dog Lake and Ponds 3 and 4. The earthen embankment was constructed in the mid 1950 as part of a single impoundment. Three internal dikes were constructed in the mid 1970s to mid 1980s to create the four ponds known today. In 2002, the Operator constructed a flood control berm

	around the perimeter of Ponds 1, 2 and 3. This berm was constructed to keep floodwaters from the Minnesota River and Black Dog Lake out of these three ponds. It is not the intent of the berm to provide additional CCW capacity. As of the date of the site visit no parts of the earthen embankment were under construction.
6.	Unknown – no supporting documentation to confirm.

Coal Combustion Waste (CCW)

Impoundment Inspection

Impoundment NPDES Permit MM0000876 **INSPECTOR** Brandon Smith

Date March 24, 2008
Impoundment Name Pond Units 1, 2, 3, and 4

Impoundment Company **Northern States Power DBA Xcel Energy**
EPA Region 5

State Agency (Field Office) Address MN Pollution Control Agency; 520 Lafayette Rd North, St Paul, MN 55155-4194
Name of Impoundment **Ponds Units 1, 2 ,3 and 4**

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New ☒ **Update** ☐

	Yes	No
Is impoundment currently under construction?	☐	☒
Is water or ccw currently being pumped into the impoundment?	☒	☐

IMPOUNDMENT FUNCTION: Water quality for NPDES permit requirements

Nearest Downstream Town Name: Eagan at State Hwy 77 Bridge

Distance from the impoundment: 0.8 mile

Location:

Latitude	44	Degrees	49	Minutes	0	Seconds	**N**
Longitude	93	Degrees	14	Minutes	30	Seconds	**W**

State MN. **County** Dakota

	Yes	No
Does a state agency regulate this impoundment?	☐	☒

If So Which State Agency?

HAZARD POTENTIAL *(In the event the impoundment should fail, the following would occur):*

☐ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

☒ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

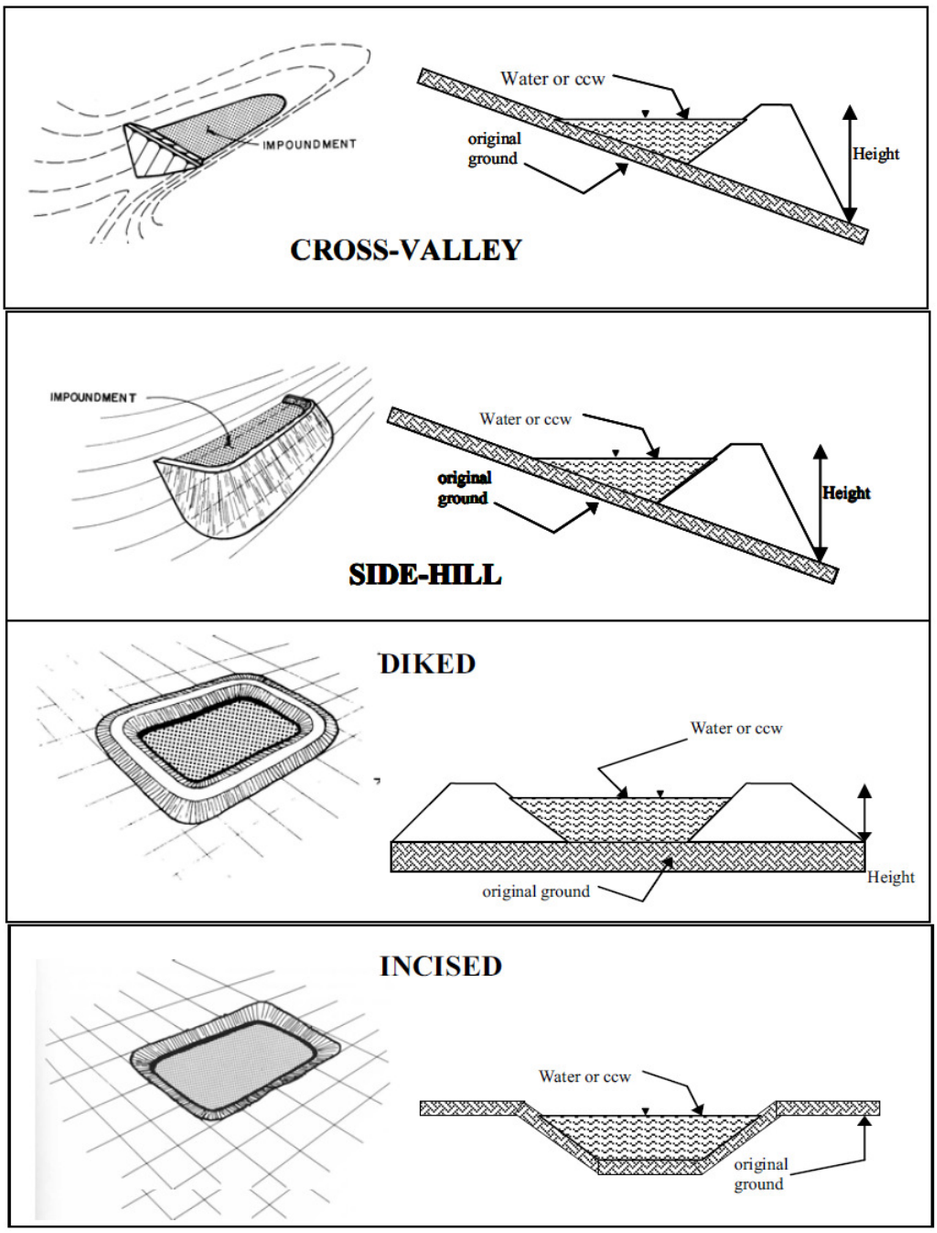
☐ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

☐ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

- There are no inhabited structures and/or public facilities immediately downstream of the impoundment should it fail.
- It is anticipated that the small impoundment area represented by Ponds 1, 2, 3, and 4 would be absorbed by Black Dog Lake should a dam failure occur.
- If a dam failure were to occur it is anticipated that there would be little to no structural damage offsite.
- Economic, environmental and lifeline losses would be low and generally limited to the Operator of the Plant.

CONFIGURATION:



☐ Cross-Valley ☐ Side-Hill ☐ Diked

☐ Incised (form completion optional) ☒ Combination Incised/Diked

Embankment Height (ft)	+/- 10	**Embankment Material**	Unknown
Pool Area (ac)	2.2, Ponds 1-3; 9.3, Pond 4	**Liner**	None
Current Freeboard (ft)	3 (705-702)	**Liner Permeability**	N/A

TYPE OF OUTLET (Mark all that apply)

☐ **Open Channel Spillway**

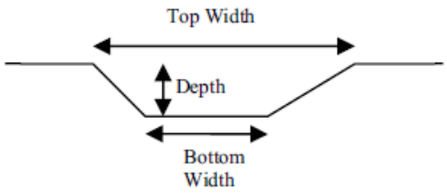
- ☐ Trapezoidal
- ☐ Triangular
- ☐ Rectangular
- ☐ Irregular

depth (ft)

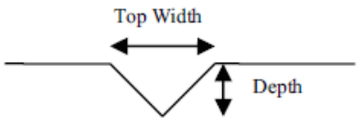
average bottom width (ft)

top width (ft)

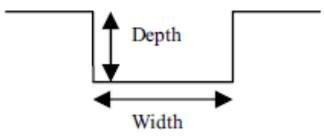
TRAPEZOIDAL



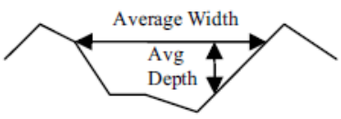
TRIANGULAR



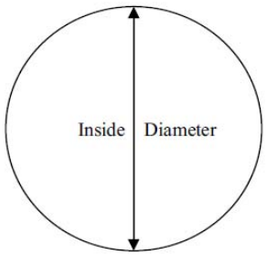
RECTANGULAR



IRREGULAR



☒ **Outlet**



Material

- ☒ corrugated metal
- ☐ welded steel
- ☒ concrete
- ☐ plastic (hdpe, pvc, etc.)
- ☐ other (specify):

	Yes	No
Is water flowing through the outlet?	☒	☐

☐ **No Outlet**

☐ **Other Type of Outlet**
(specify):

The Impoundment was Designed By

Unknown who designed original 1950s single pond. Glen S. Bengtson, P.E and James K. Poucher, P.E. certified early 1980s design drawings that apparently

were used to transform the single pond into the four ponds known today. However, there exact involvement in the project at that time is not known.

	Yes	No
Has there ever been a failure at this site?	☐	☒

If So When?

If So Please Describe :

	Yes	No
Has there ever been significant seepages at this site?	☐	☒
If So When?		

If So Please Describe :

	Yes	No
Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site?	☐	☒
If so, which method (e.g., piezometers, gw pumping,...)?		

If So Please Describe :

ADDITIONAL INSPECTION QUESTIONS

Concerning the embankment foundation, was the embankment construction built over wet ash, slag, or other unsuitable materials? If there is no information just note that.

To the best of our knowledge this information does not exist.

Did the dam assessor meet with, or have documentation from, the design Engineer-of-Record concerning the foundation preparation?

To the best of our knowledge this information does not exist.

From the site visit or from photographic documentation, was there evidence of prior releases, failures, or patchwork on the dikes?

To the best of our knowledge this information does not exist.